January
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Successful Construction Methods

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THE OPEN ROAD
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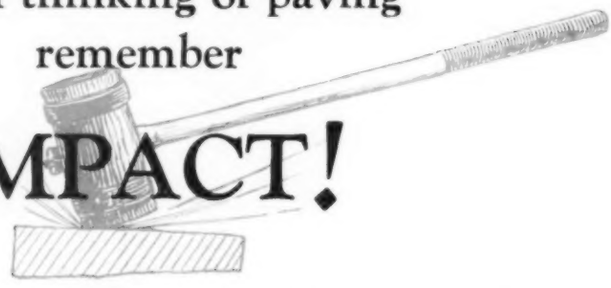

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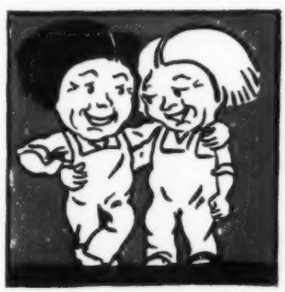
Successful
Construction
Methods

Hitting the High Spots

WE HAVE taken to the road this month as you will doubtless discover before you have gone far in this issue of *Successful Construction Methods*. We have done so because we believe that the annual Convention and Road Show of the American Road Builders' Association in Chicago this month (January 10th to 14th) is deserving of the attention and interest of everyone identified with the great construction industry of which in the last few years road building has come to be so important a part. The modern highway has become indispensable to national business and to national pleasure. *Successful Construction Methods* gladly gives over its pages this month to a pictorial cross-section of the highway industry.

A word about our cover. It not only shows a Pennsylvania highway, but the photograph itself came from the files of the Pennsylvania Highway Department to which we are indebted for a picture which gives so typical and pleasing a glimpse of a modern American road.

WHAT sort of roads interest you most? We have all kinds, and all good, with the exception of a few old timers dropped in here and there to help you to realize how fortunate you are to live today.



We have those two old rivals, black top and white top, dwelling in peace and harmony between our covers. We have brick roads and gravel roads, county highways and city streets, and the machines which build them. Maintenance, which is growing in magnitude from year to year, gets its share of attention. There is a snow removal article and some highway bridges. Every section of the United States is represented and there is a picture or two from other countries as well.

AT THE risk of causing a stampede in that direction, let us call your attention to pages 14 and 15 where we have set down faithfully a description of a road that is paved with gold. The gentleman who sent us that article is an engineer and so entitled to the measure of belief that is usually accorded to members of that fraternity. He declares that $3,000 worth of gold is imbedded in each and every mile of that concrete pavement. We have known contractors who have dropped far more gold than that into each mile of pavement, but that's another story that doesn't belong in a magazine with a name like ours.

We all have listened to steam shovels, but usually they have been rather unintelligible. With the aid of a man who spends much of his time among them, not because he wants to, but because he has to, we have succeeded in finding out what a steam shovel thinks and talks about. If you are interested, look on pages 28 and 29.

THE highway industry is moving along so fast that pictures taken only a few years ago look like genuine antiques. We dug up a few of them for your inspection (pages 41, 42, 43). You may find yourself in one of them.

Beginning with the February issue we are going to award three prizes for photographs each month instead of only one. The monthly photographic contest has produced so many good pictures that it has seemed unfair to reward only one man. So there will be three prizes in February. If you have mislaid your old camera, hunt it up and send us some pictures of your job. Perhaps some of our money will find its way into your pocket.

We didn't forget it, we just saved it for the last.

HAPPY NEW YEAR

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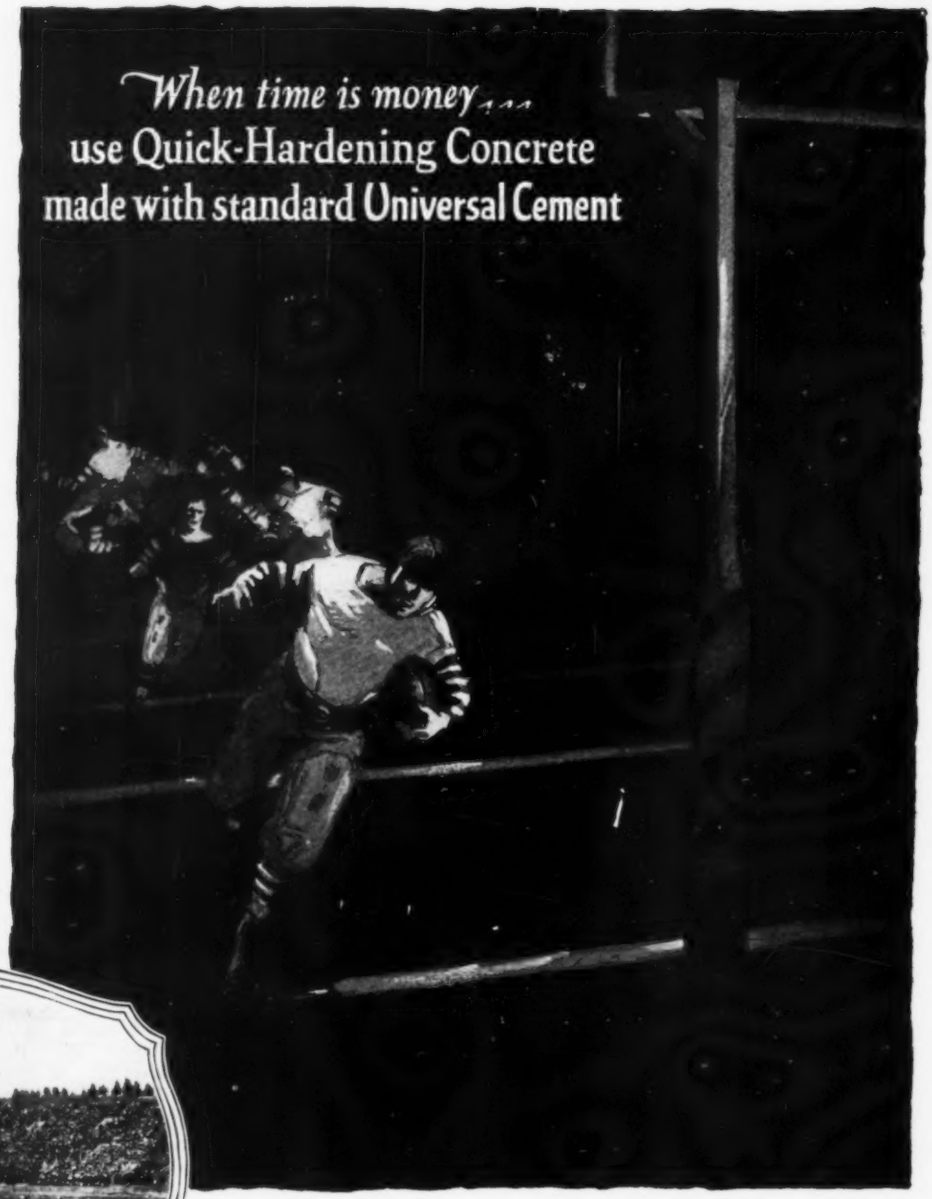

East Stand, Northwestern University Stadium, Evanston, Ill. James Gamble Rogers, New York, architect; Gavin Hadden, New York, engineer; J. B. French Co., Chicago, contractors; standard *Universal* cement furnished by the Central Coal and Material Co., Evanston.

—and the game was played as scheduled!

September 2—football time a month away; Northwestern University scheduled to open the season in its new stadium; much construction still to be done.

Faced with the penalty of 50 cents for each seat not completed on schedule, the contractors eliminated long delays in removing forms and shoring by using High Early Strength *Universal* Concrete. As a result, they were able to complete the work on time. The penalty was avoided.

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A Monthly Pictorial of Field Practice and Equipment
GENERAL CONSTRUCTION—HIGHWAYS—BUILDINGS
ENGINEERING—INDUSTRIAL

WILLIAM JABINE
Editor

VOLUME 9 | NEW YORK, JANUARY, 1927 | NUMBER 1

One of Rhode Island's bituminous macadam roads.

Turning the Corner

"WHAT is the most pressing problem that confronts the highway industry today?" *Successful Construction Methods* asked that question of a group of men prominent in highway work in the United States and their replies will be found on the next two pages.

There seems to be one inescapable conclusion to be drawn from the statements. The great highway industry has turned a corner. The old cry of "Get them out of the mud," is heard no more. The nation has recognized the fact that improved roads are a necessity. To be sure there always will be scattered, slow-thinking communities which will lag behind, but they can be taken care of without much trouble. So far as the nation is concerned, the first great fight of the modern road building era is won. Adequate mileage of improved roads is assured.

And with characteristic vision and energy, the men who are the leaders of the highway industry are looking forward to the solution of new problems. They see that an improved road must be a safe road, that better regulation of traffic is essential, that legislation should be uniform. In order to accomplish these ends, highways must be widened, road signs must be standardized, grade crossings eliminated, snow must be removed, maintenance must be thorough and continuous. There is even more work ahead than has been done thus far.

With this work *Successful Construction Methods* will keep in touch. Its program for the year that is just beginning includes a greater emphasis on the new trend of highway thought. It will do what it can to further the work of men like Babcock and MacDonald, Shirley and Ellison, whose sound and progressive views it gladly presents on the next two pages.

Successful Construction Methods was founded in 1919. It was known as *Successful Methods* until two months ago.
The first editor of the magazine was Charles R. Thomas, who was in charge of the first few issues, with William Jabine as his assistant. In the fall of 1919, the magazine was put in charge of Mr. Jabine, and he has been editor since that time.
The McGraw-Hill Publishing Co. has been publishing *Successful Construction Methods* for about seven months, beginning with the June issue of last year.

The Most Pressing Highway Problem

C. M. BABCOCK
Commissioner of Highways
Minnesota

"ACCIDENT prevention is unquestionably the most pressing highway problem to be solved during the next few years. Highway safety may be promoted through legislation, enforcement, education and construction.

"Legislation should be made uniform. Traffic control methods should be worked out by engineers and scientists rather than by policemen. Enforcement should be made uniform. The aim should be not to restrict traffic, but to help traffic to move safely.

"Education should be continuous. Safety principles should be taught in the schools. The need of eternal caution must be impressed on all drivers repeatedly. Construction for safety should continue along present lines: widening narrow roads, providing sight distance, and eliminating grade crossings, sharp turns and other hazards as rapidly as possible."

CHARLES M. BABCOCK

"IN MY judgment the most pressing highway problem with which we are now confronted is that of relieving congestion and providing for the uninterrupted flow of traffic in the vicinity of the large cities.

"The conditions requiring immediate relief are found mainly in the East; and the principal need is the construction of by-pass roads to carry through traffic around the cities.

"ON THE important traffic arteries as they approach the cities, elimination of grade intersections with railroads is a matter of economy as well as of safety.

"The halting of traffic at crossing gates and other points of congestion nullifies the principal advantage of the motor vehicle—the saving of time."

THOS. H. MACDONALD

THOS. H. MACDONALD
Chief, Bureau of Public Roads

"THE most important pressing problem to be solved is the Control of Traffic over our highways.

"There are many miles of road in this country, constructed at a large cost, that are not giving a proper return for the amount expended, due to inadequate traffic control.

"The pressing problem facing the public at the present time is to speed up traffic to a point where the highways will give the maximum amount of service and yet be reasonably safe.

"It is realized that in the near future there must be maximum and minimum speeds, and traffic control must be within these limits. The slow moving traffic is an increasing danger as well as an impediment to the proper flow of traffic and the highways rendering the maximum service to the users.

"The great problem for the people is to educate the driver how to operate his vehicle at a rate of speed that will be safe and yet pass over the highways expeditiously. Not only must the control of traffic be such as to ascertain and eliminate the careless and reckless driver, but also improve or eliminate the driver who does not keep up to a reasonable speed and operate his vehicle so as to give the maximum amount of road for other users.

HENRY G. SHIRLEY
Chairman, Virginia Highway Commission
Pres. American Road Builders' Assoc.

"This problem is one that will take much education to bring to a reasonable degree of efficiency and a great deal of legislation to hasten and aid in its perfection. Strict examinations will have to be passed before a license is issued to an operator and he or she must have sufficient experience to operate a vehicle without creating a danger to himself or herself or to others in the use of the highway.

"The number of miles of highways constructed, and to be constructed within the next decade will be greatly congested in carrying the traffic that will go over them, unless the maximum use by efficient and intelligent handling of this traffic is brought about.

"At the present time many operators drive practically as he or she sees fit without any idea of the value and use of the highway as a transportation unit, and are therefore not interested in the maximum use of the road but only for their pleasure.

'The great problem, as I see it, is to build highways that will carry the traffic that will go over them in the reasonably near future and control this traffic so as to get the maximum use of the highways and the largest possible return on the investment."

H. G. SHIRLEY

50809

W. E. HART
Highways Bureau
Portland Cement
Assoc.

J. H. ELLISON
Vice-Pres.
Winston-Dear Co.,
Minneapolis, Minn.
Pres. Associated
General Contractors
of America

"THERE are many problems confronting state, county and city highway officials due to the present demands made by the travelling public. I consider the lack of adequate transportation facilities, the greatest obstacle they have to overcome.

"We need wider highways entering our large cities. Public opinion now demands that when we buy a car we shall have highways wide enough to permit us to drive without excessive traffic delays and with a reasonable degree of safety. The present prosperity of the country indicates that the number of automobiles will increase rather than decrease, thereby accentuating the highway problem.

"County and state officials are recognizing the necessity of establishing right-of-ways for highways that will permit of widening as traffic on those highways increases. The thoughtfulness and foresight of these men should serve as a guide to every community in the country."

W. E. HART

"IT SEEMS to me that the greatest need of the highway industry is more careful study on the part of those qualified to reach a reasonable and definite determination of what constitutes the best highway, all conditions considered. I believe that we lack definite information on this subject which could and should be obtained by practical men in the engineering departments and construction departments of our highways.

"I realize that much study has been given to this matter, but we have not yet been able to lay down any hard and fast rule as to what particular type of hard surface highway is best adapted to the needs of any given community. It seems to me that when we have this question settled it will greatly simplify the problems which now confront us, and I believe that it can be settled if all of us will get together to consider the matter in its broad aspect without regard to any selfish interest which we may have in the outcome."

J. H. ELLISON

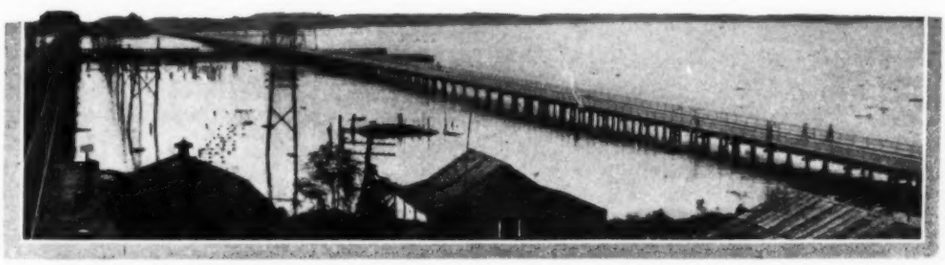
Road Builders to Meet in Chicago

McGraw-Hill Publications Will Furnish Special Service at Coliseum

THE American Road Builders' Association, which was founded in 1902, will hold its annual Convention and Road Show in Chicago, January 10th to 14th. The Convention this year will be held for the first time in the Palmer House instead of in the Congress Hotel as in the last few years. The Convention meetings will be held on January 11th, 12th and 13th. As was the case last year, most of the convention sessions will be divided into two sections, one dealing with engineering problems and the other with construction problems. The Road Show will be held in the Coliseum and will be officially opened at 8 p.m. on Monday, January 10th. It will close on Friday, January 14th.

Reduced railroad rates have been arranged for the Convention and Road Show. Before buying your ticket, consult your local ticket agent in regard to these rates and procure the proper certificates to be validated at Chicago. Hotel accommodations will be arranged by a special hotel committee. All information in regard to hotels, convention program, annual banquet, etc., may be obtained by writing to C. M. Upham, Palmer House, Chicago.

A new service for those attending the Road Show will be offered this year by *Successful Construction Methods* and *Engineering News-Record*, both published by the McGraw-Hill Publishing Company. This will consist of a message receiving and delivery service, a free telephone service for local calls, and classified equipment lists which will make it easier to find all kinds of equipment at the Road Show. These services will be offered at Ball Room booths Nos. 10, 11, 20 and 21. These booths are just inside the doorway of the Ball Room which can be reached from the south balcony of the Coliseum. The Road Show phone number of these booths is Victory 3630, and through this number messages may be sent to any booth at the Coliseum. All of these services will be free. Representatives of both publications will be in attendance at the booth and will be glad to answer any questions concerning them.

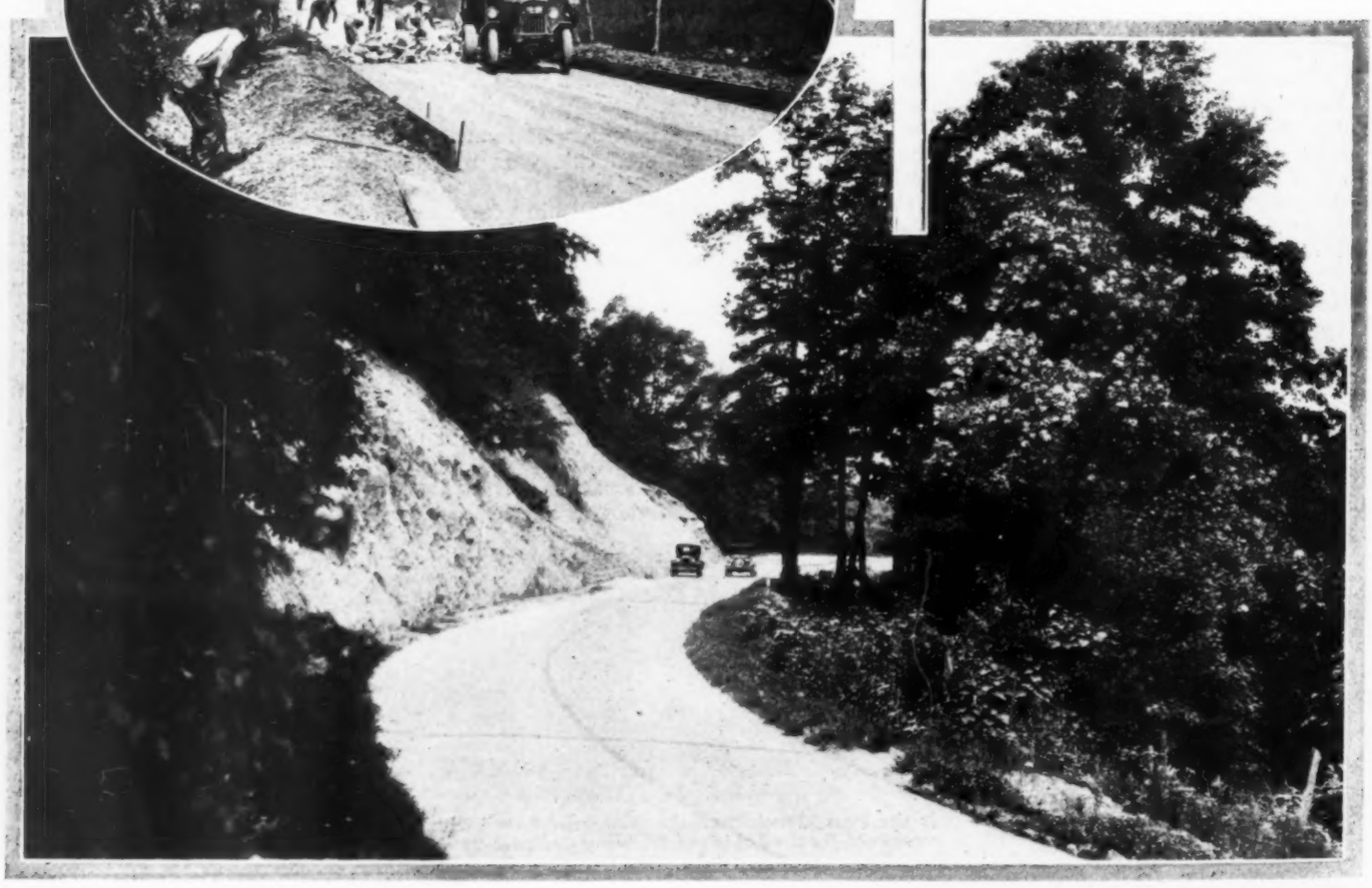


Highway bridge over the Pass Manchac on the Hammond-New Orleans road recently completed for the Louisiana Highway Commission

50809

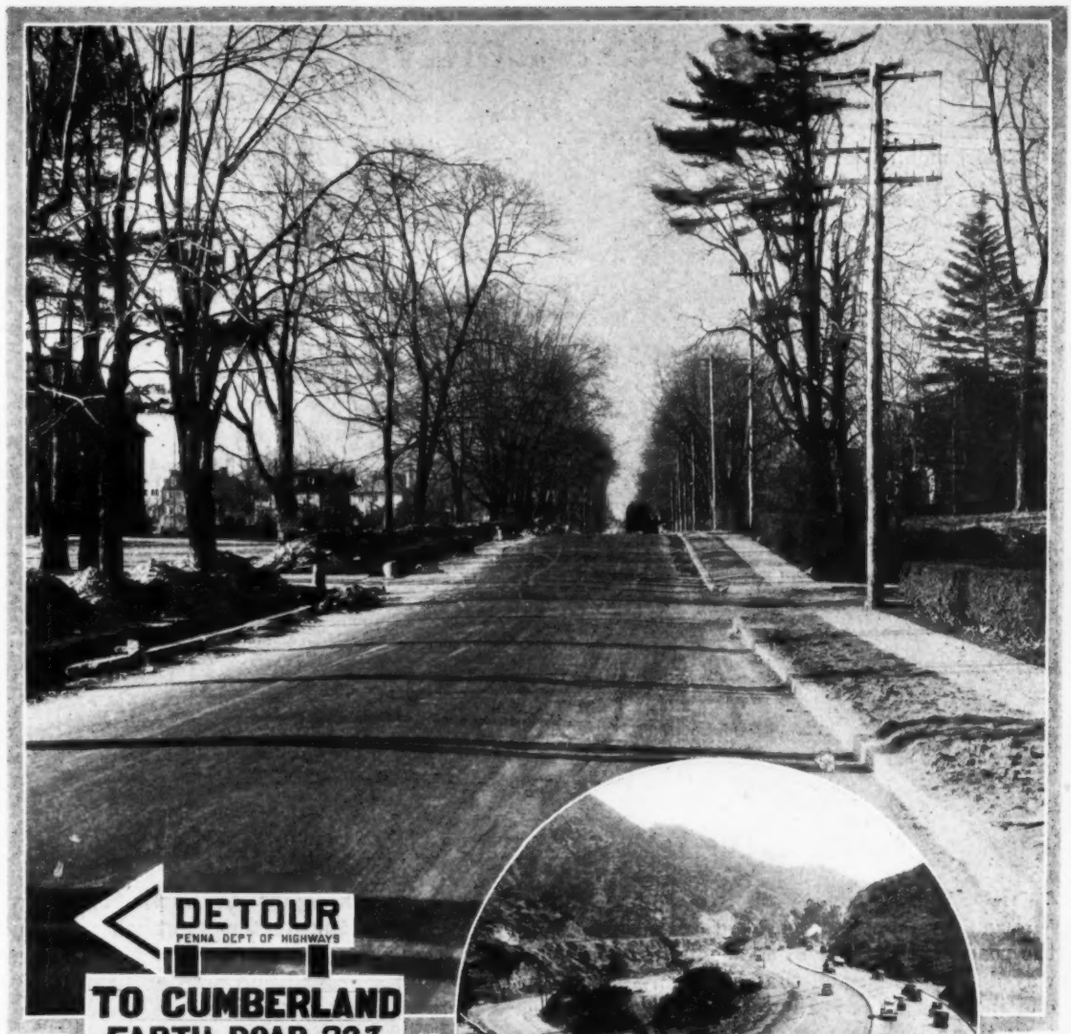
Improved

A few short years ago highway improvement meant just one thing. It meant the replacement of roads like that shown at the left by highways like that at the bottom of the page. The state in which the upper photograph was taken, only five years ago, prefers to remain anonymous, the picture in the oval shows the laying of the stone base for a modern macadam road in West Virginia, and the lower scene was taken on one of North Carolina's concrete highways.



Highways

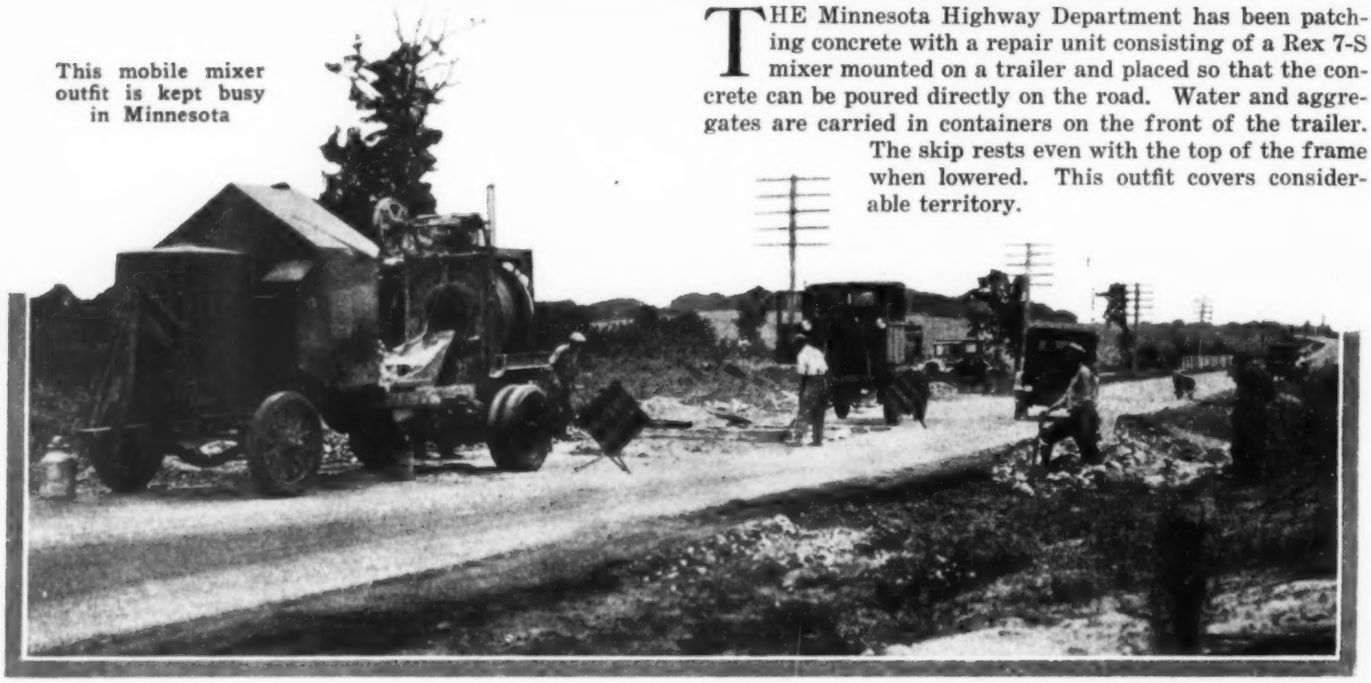
At the present time highway improvement means far more than putting a hard surface on a road. It means making the way safe, relieving congestion and similar refinements. The two large photographs on this page show the Chester Pike in Pennsylvania before and after improvement. Both photographs were taken at the same spot and show how the pavement was widened. The picture in the circle shows the newly widened Cahuenga Pass road in Los Angeles, with the old road at the left.



Minnesota's Concrete Patching Outfit

This mobile mixer outfit is kept busy in Minnesota

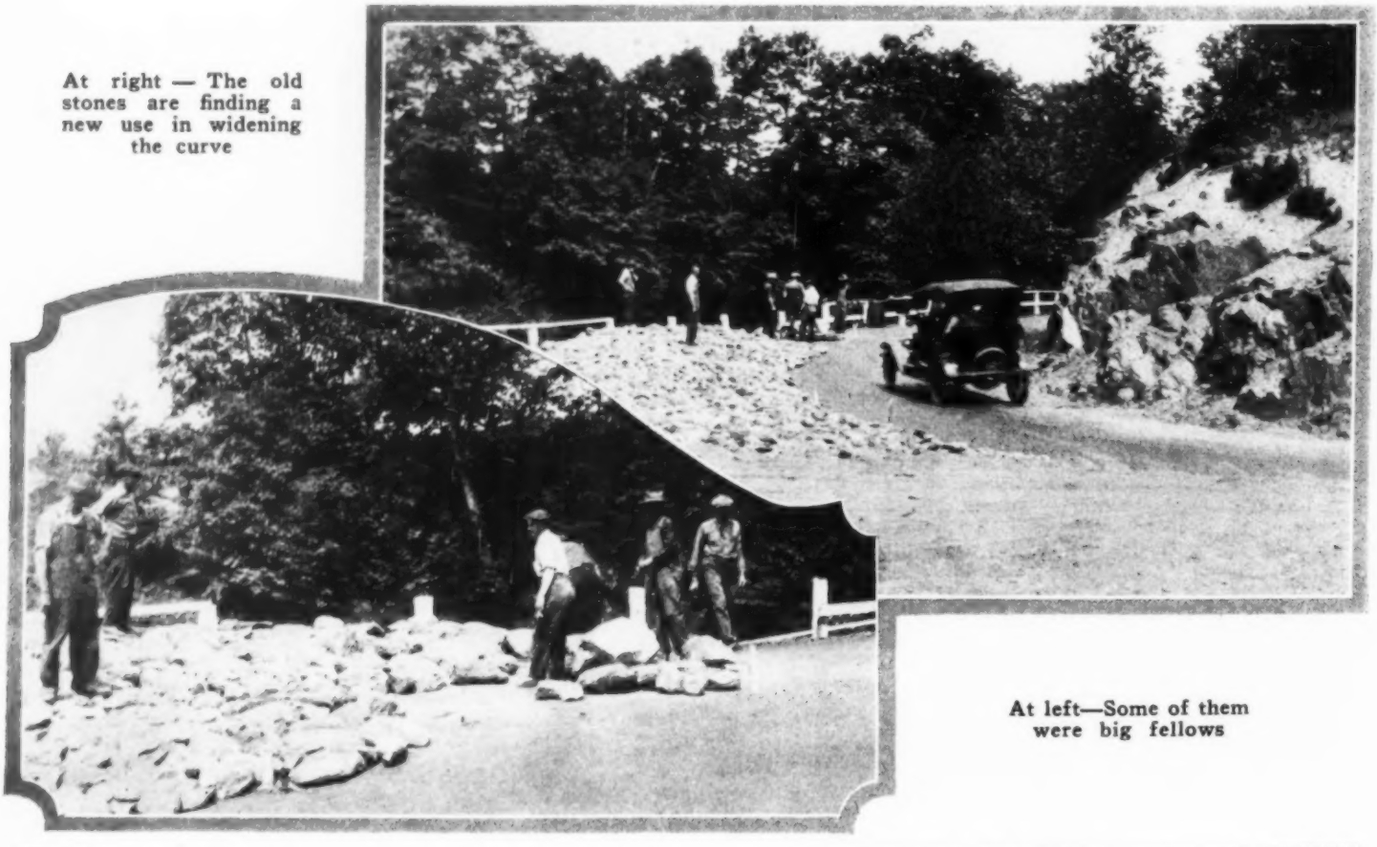
THE Minnesota Highway Department has been patching concrete with a repair unit consisting of a Rex 7-S mixer mounted on a trailer and placed so that the concrete can be poured directly on the road. Water and aggregates are carried in containers on the front of the trailer. The skip rests even with the top of the frame when lowered. This outfit covers considerable territory.



Old Stone Walls Used for Road Repairs

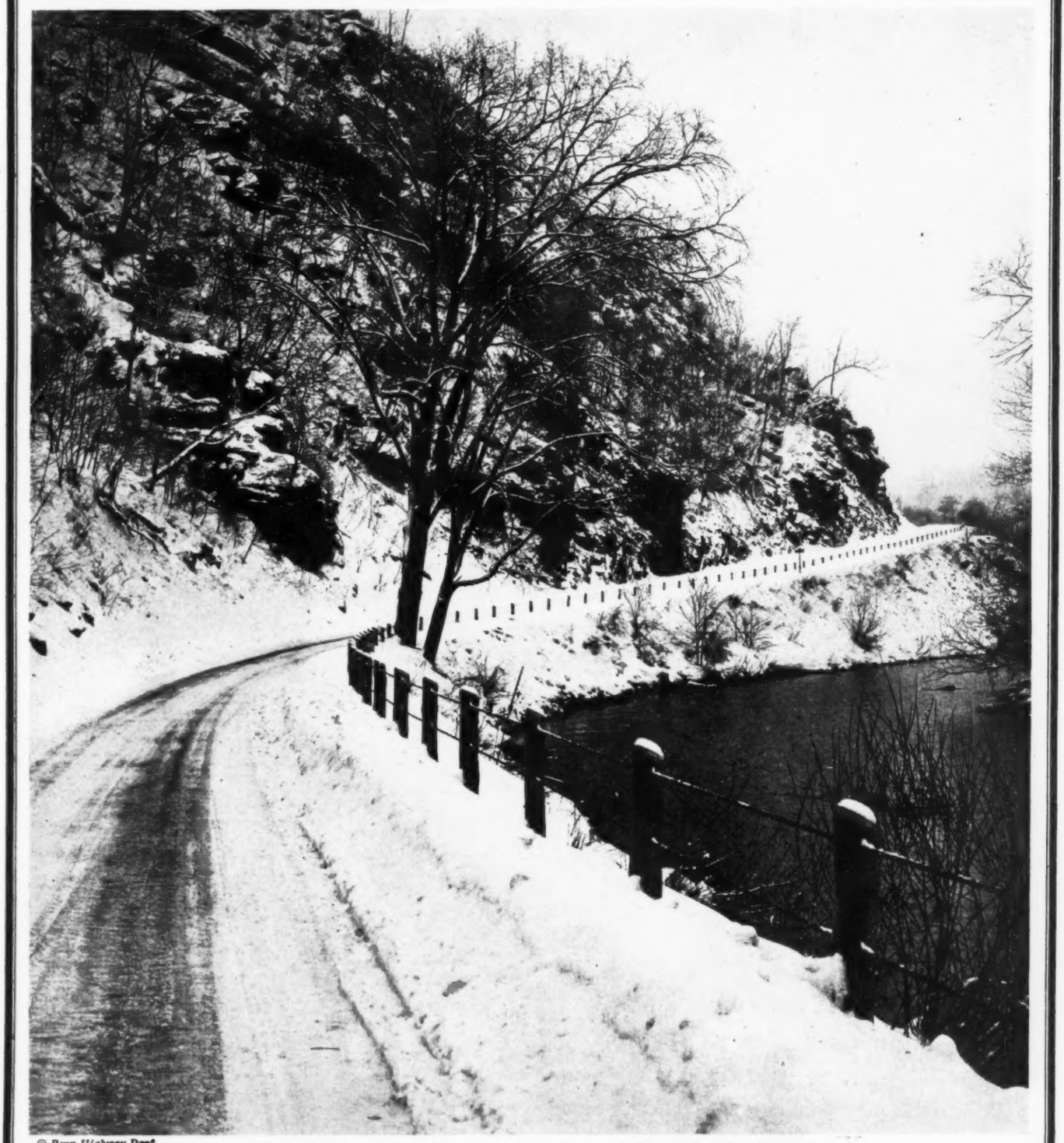
THOSE old stone walls which have adorned eastern countrysides since before the Revolution are going into the roads. The farmers are selling them to the state highway departments, and the accompanying photographs show one instance of how they are being used. These pictures were taken in Westchester County, New York, on the north shore of Croton Lake, and show a curve being widened and banked at a point where a number of accidents have occurred. Directly behind the guard fence shown in the background is a drop of about 15 ft. to an arm of Croton Lake. All of these stones came from stone walls purchased from neighboring farmers.

At right — The old stones are finding a new use in widening the curve



At left—Some of them were big fellows

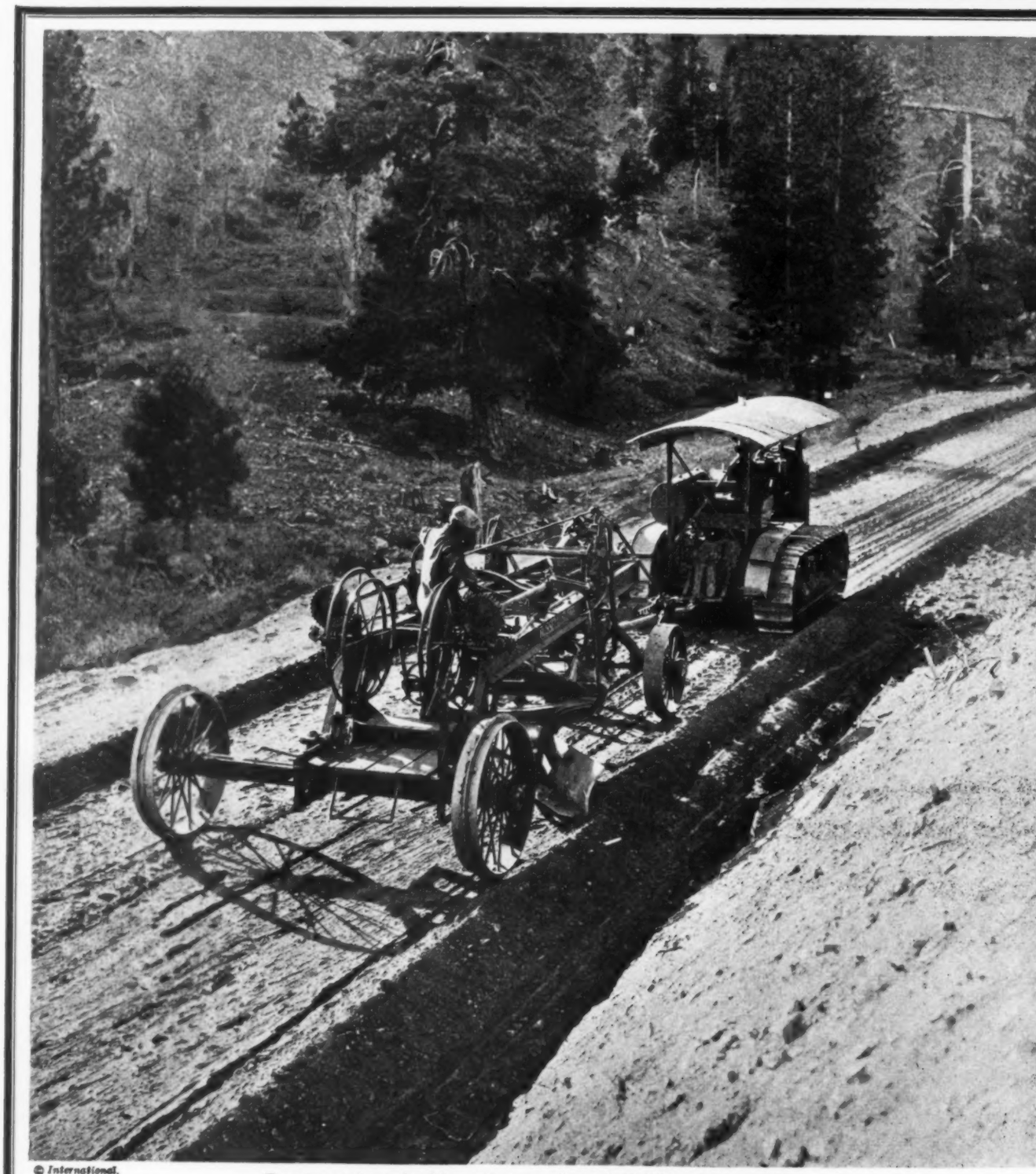
BLUE BOOK



© Penn Highway Dept.

Even in Winter the road must be kept clear. A Pennsylvania highway

BLUE BOOK



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Tractor and grader blaze the way through California mountains

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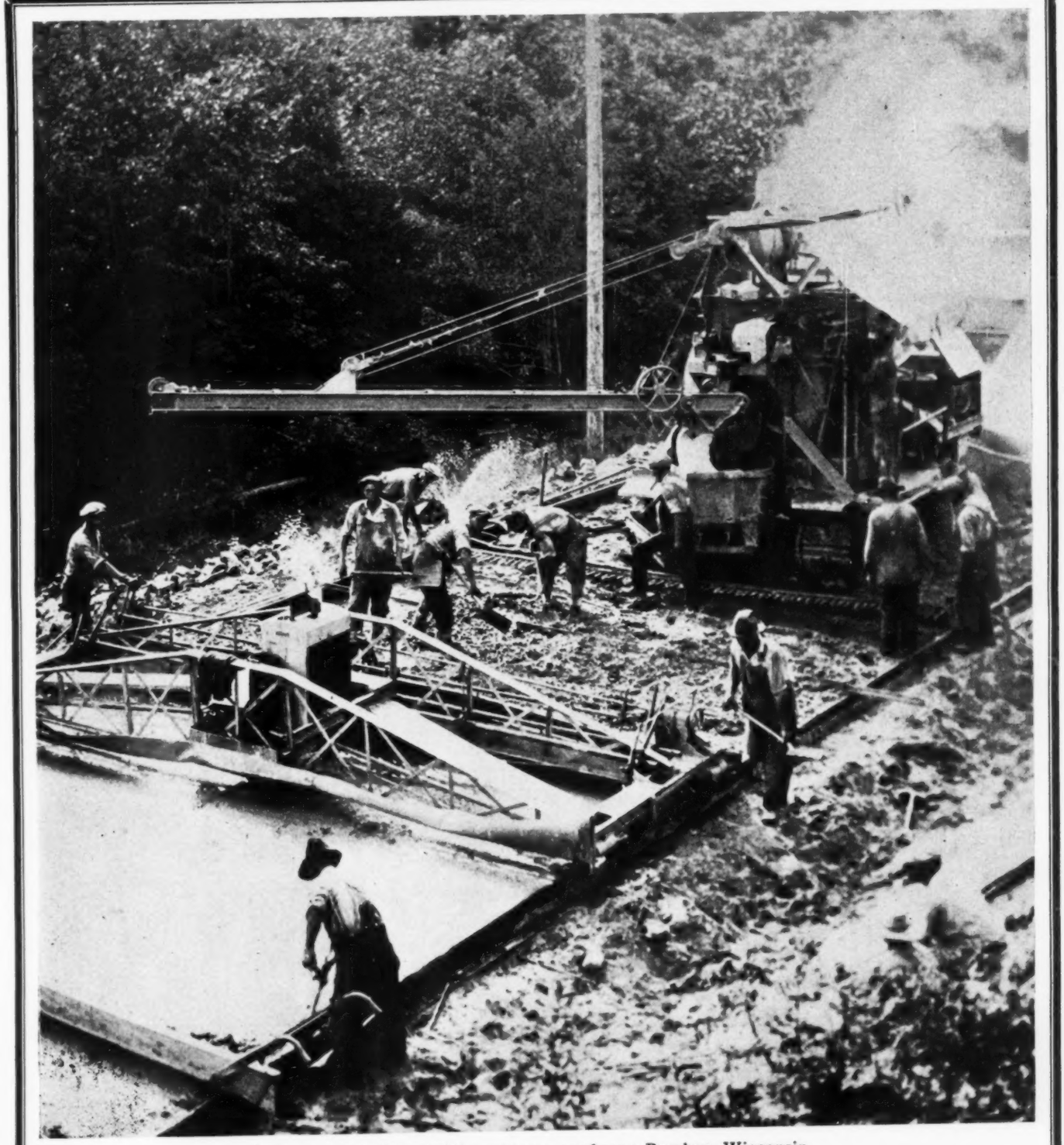
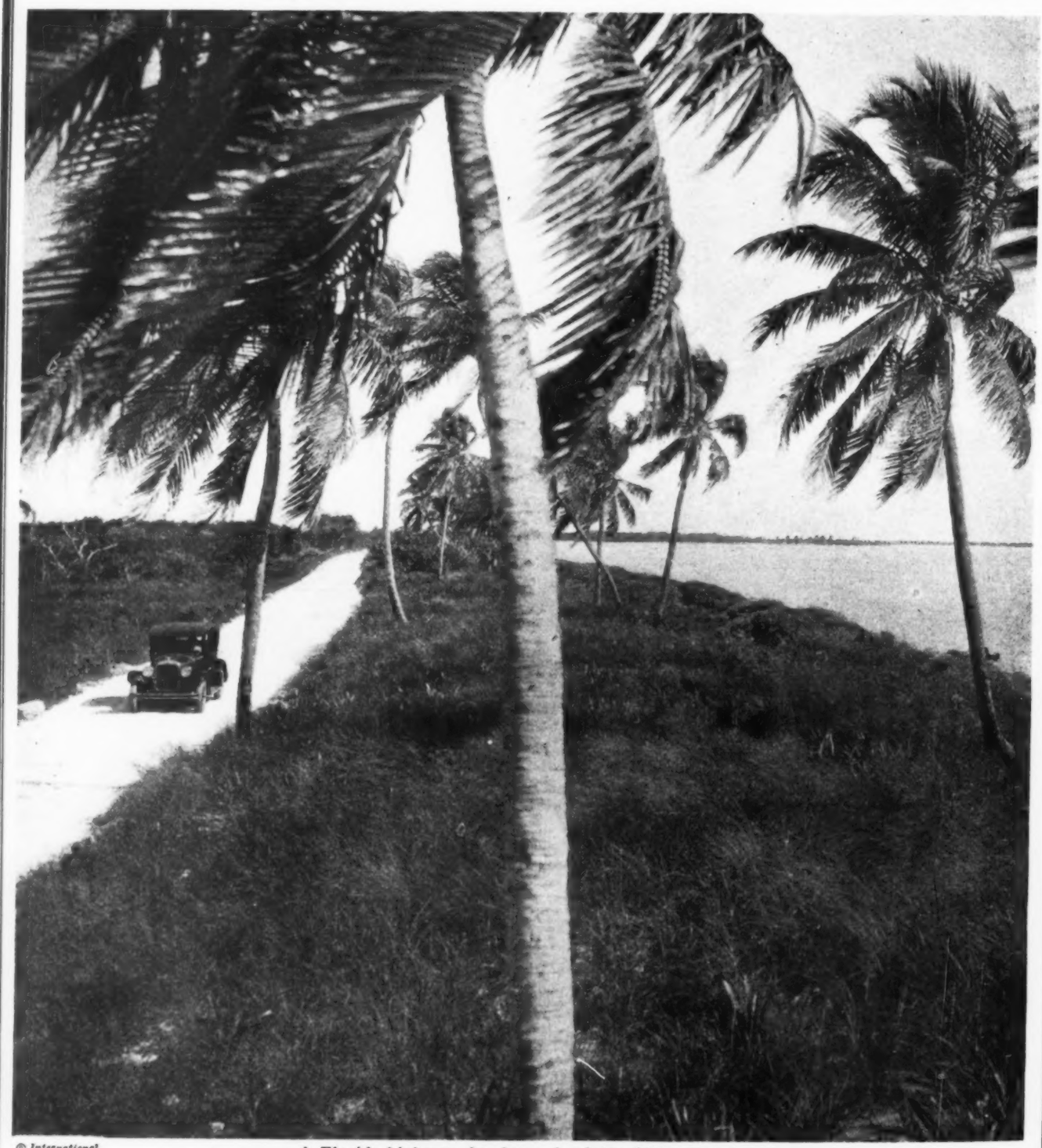


Paver and finisher build a concrete road near Baraboo, Wisconsin

BLUE BOOK



© International.

A Florida highway that keeps in sight of blue water

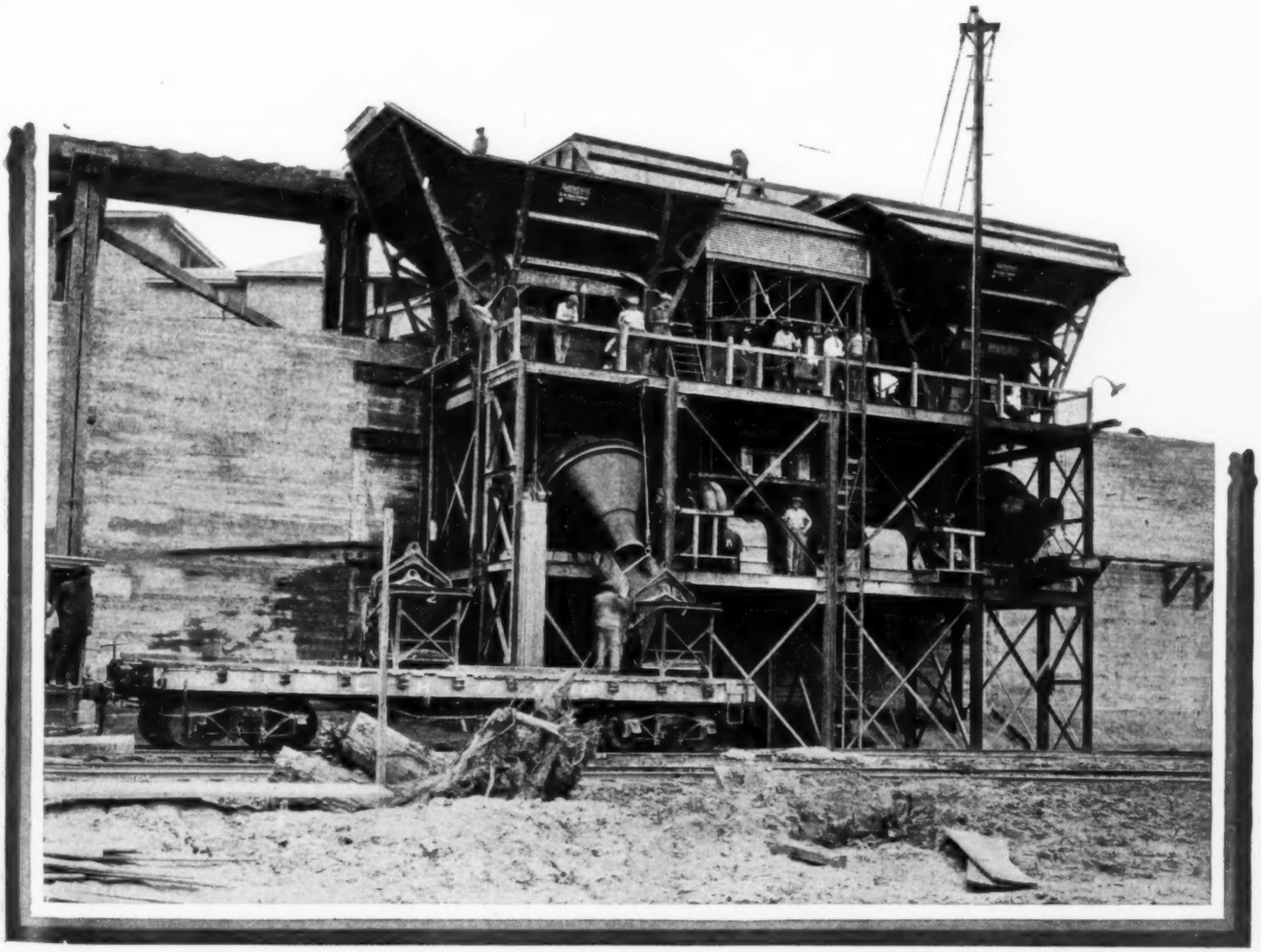
More Money for Photographs

Beginning With the February Issue Three Prizes Will Be Awarded—First $25, Second $15, Third $10

BEGINNING with the February issue, three prizes instead of one will be awarded in the monthly photographic contest. The man who sends us a photograph most suited to the needs of *Successful Construction Methods* will receive $25.00. The second prize will be $15.00 and the third prize $10.00. The decision to increase the number of prizes was reached because of the fact that so many good photographs have been received each month and it has seemed unfair to award only one prize.

The conditions remain as before. The photographs must be taken by a man actually employed on the job and should be sent to *Successful Construction Methods*, Tenth Avenue at Thirty-sixth Street, New York City, by Monday, January 10th, and plainly marked Photographic Contest. Photographs received after that date will be entered in the March contest. *Successful Construction Methods* will pay for all non-prize-winning photographs which it uses.

Successful Construction Methods thus far has awarded six monthly photographic prizes. A large number of the readers of the magazine have entered their pictures and in the year that is just beginning, it is expected that the competition will be keener than ever. Get out your camera and send along a picture of the work you are doing.



THE winner of the January, 1927, prize is Marshall Gray, senior draftsman in the United States Engineer's office at Louisville, Kentucky. The photograph shows a giant Blaw-Knox mixing plant which is now being used in the construction of the new power-navigation dam at Louisville, Kentucky. The work on this dam was described at considerable length in the November issue of *Successful Construction Methods*. This mixing plant consists of a pair of 2-yd. mixers equipped with inundators and electrically operated. The concrete is transported to the place where it is needed on railroad flat cars hauled by Plymouth gasoline locomotives. The plant is equipped with flood lights for night operation.

Colorado's Golden Highway

Precious Metal Goes Into Pavement on Five-Mile Project—Central Mixing Plant Used

A MATERIAL that adds greatly to the richness of the concrete was tried out recently by the Colorado State Highway Department on a Federal Aid project on the Denver highway north of Colorado Springs. Every mile of this 5-mile project contains $3,000 worth of gold which found its way into the pavement by reason of the fact that the crushed rock used in making the mix was shipped from the ore dumps of the Cripple Creek gold fields. The gold content in this material is assayed at $1.50 per ton and in each mile about 2,000 tons of stone are used, thus accounting for the $3,000 in gold. Whether or not this gold shows up in the surface of the pavement is not stated by V. H. Littlefield, Resident Engineer of the State Highway Department, who sent this article and the accompanying photographs to *Successful Construction Methods.*

Apart from its gold content, this job is of interest because of the fact that it was handled from a central mixing plant which is illustrated in tne photographs on the opposite page. The mixed concrete was hauled from this plant to the paver in 1-ton Ford trucks, a fleet of ten of these trucks being kept busy.

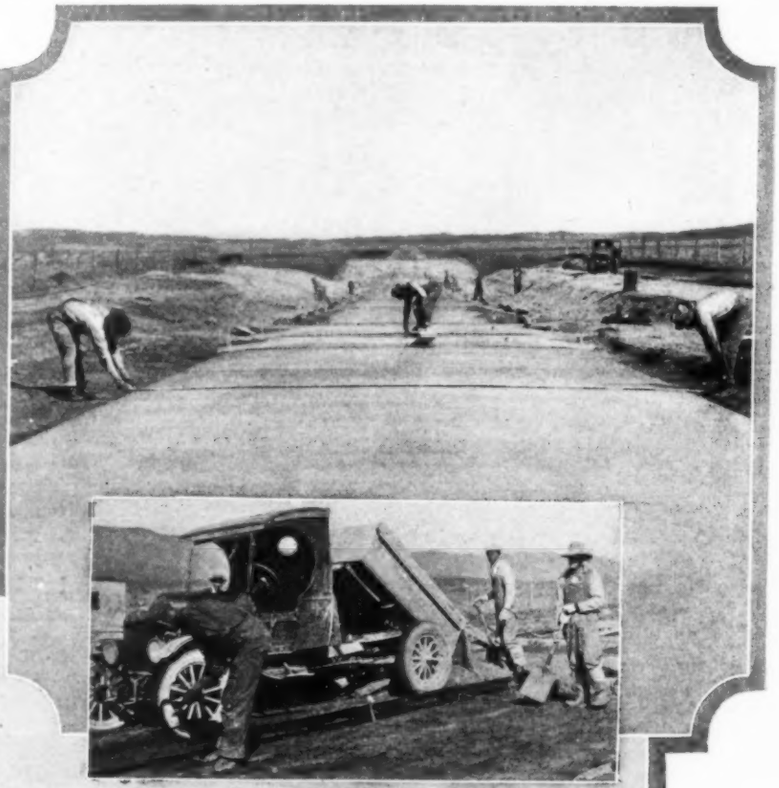
The contractor on this job was J. L. Busselle & Company of Colorado Springs. The work of laying concrete began September 1st, the dirt work and grading having been in progress since last April. About 110,000 cu.yd. of excavation was necessary before paving began.

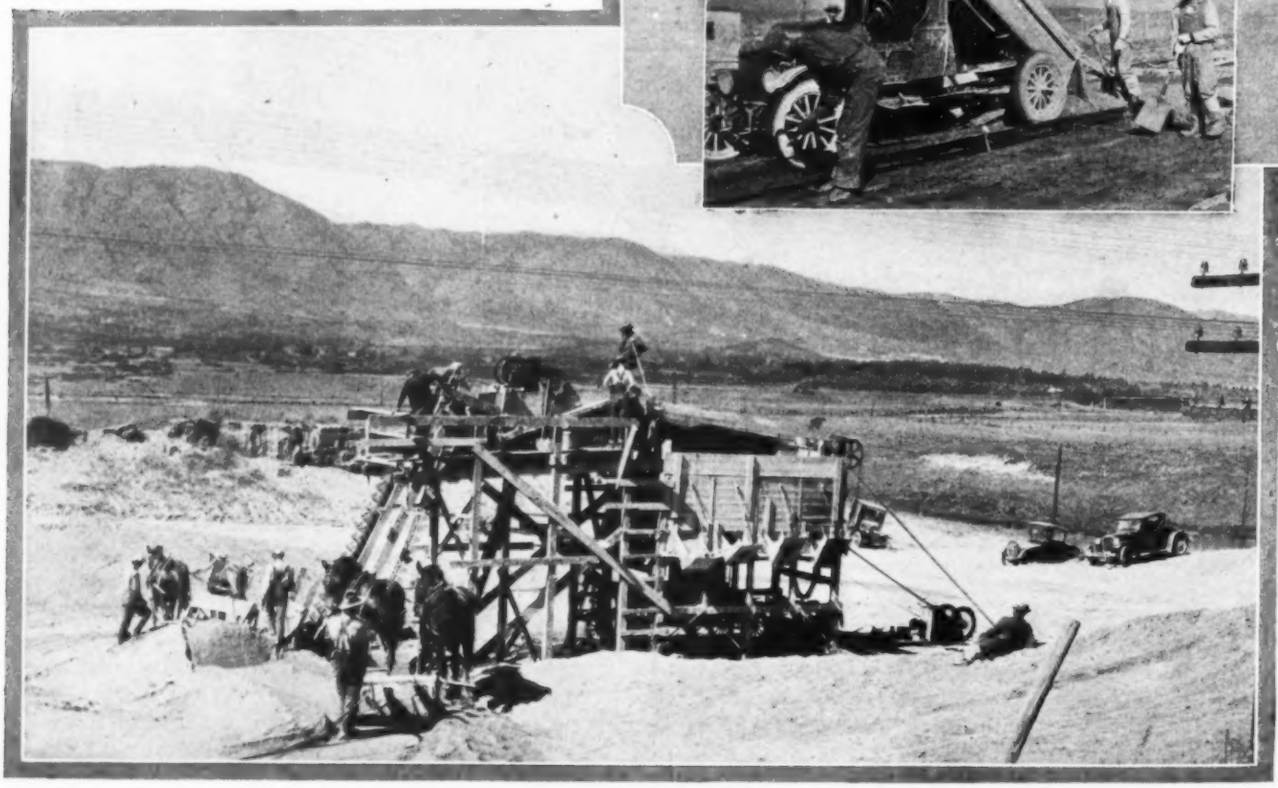
The sand used on the job is obtained at pits less than 2 miles from the plant and was of such even grade that the regular pit run was used after a preliminary washing.

The three photographs on the opposite page give a clear picture of the way in which all of the aggregates were handled at the central mixing plant.

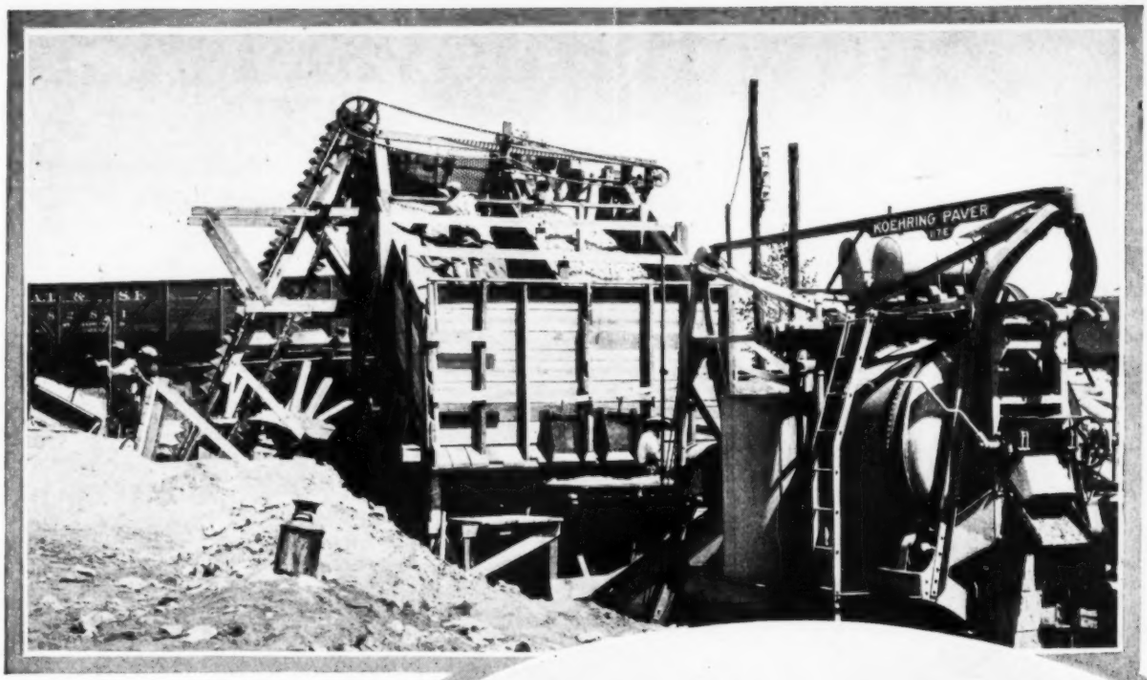
The contract price for the work was $200,000 and 50 men were employed. Russell Dunn was the superintendent in charge for the contractor.

The job included one 80-ft. bridge and about 35 culverts of various kinds. Ernest Montgomery was the division engineer in charge for the Colorado State Highway Department.



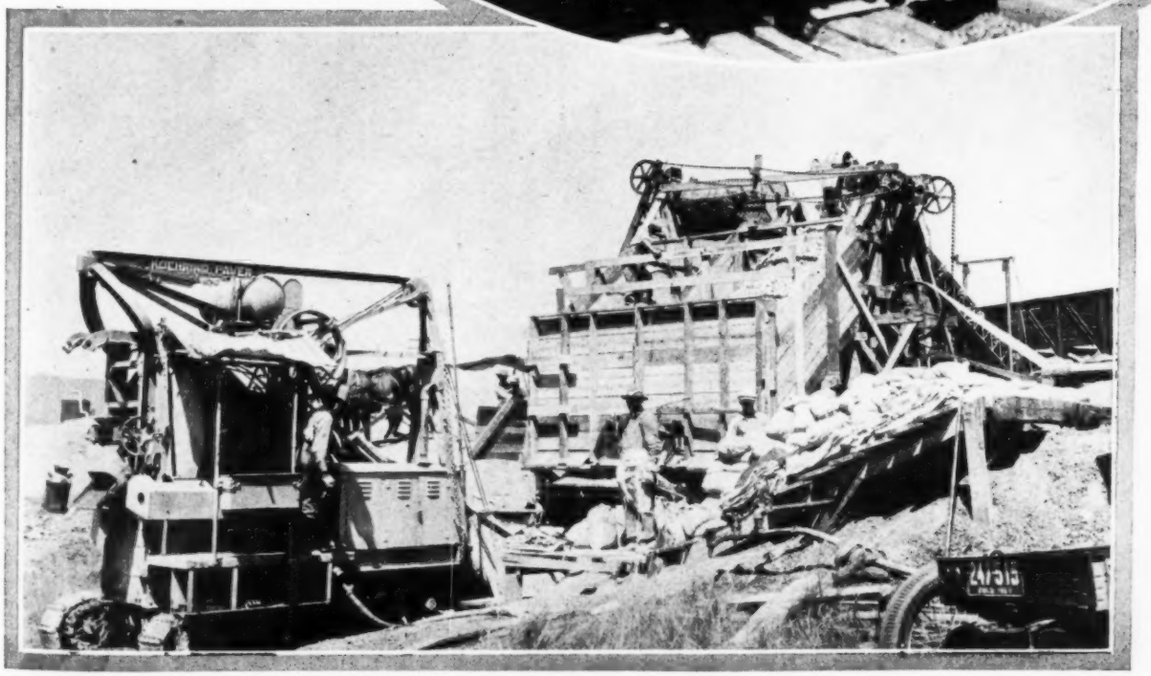


A section of the finished pavement is shown at the right. A truck dumping its load of concrete on the subgrade is in the center and the sand plant is shown below



Sand was deposited in the proportioning bins by the bucket elevator at the left. A freight car which has brought a load of crushed rock may be seen in the background

A portable belt conveyor transferred the crushed stone, gold and all, from the freight cars to the proportioning plant which in turn supplied the mixer



This view of the central mixing plant shows how the cement was handled on a sloping platform. The cement was dumped into the skip on top of the sand and stone

Snow Removal Is Part

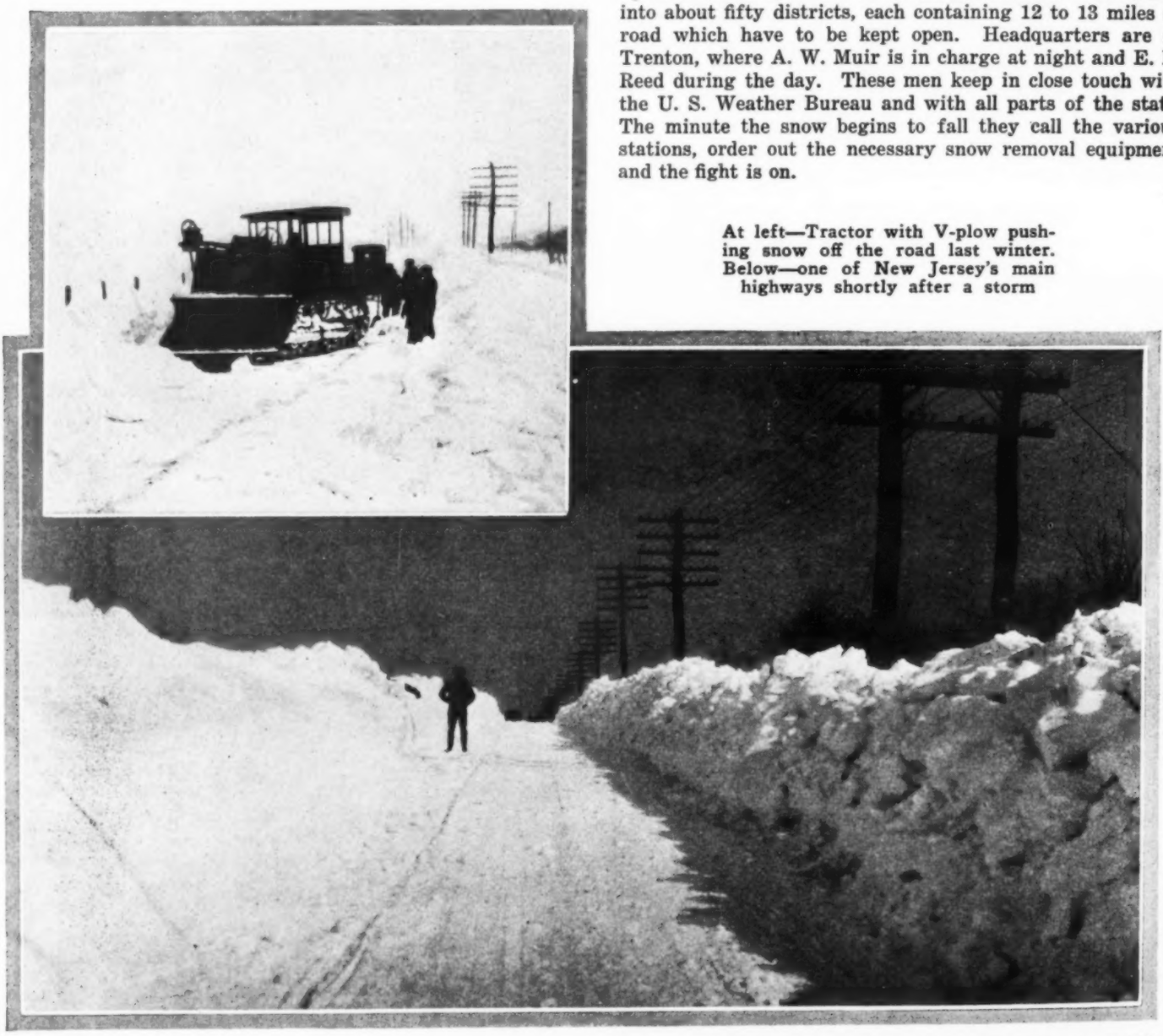
New Jersey Uses Efficient Methods In Fighting the Drifts

SNOW removal presents an annual problem to every state in the northern half of the country. Up to seven or eight years ago, little or no snow removal was attempted on country roads, the great cities of the country having an almost complete monopoly of this expensive and difficult task. During the war certain states, such as New Jersey and Pennsylvania, began keeping the roads open during the winter in order to facilitate the shipment of war supplies, and since then one state after another has joined the procession, until now every snow state in the country is doing some sort of snow removal work either by the state highway department or by local units, such as towns and counties. A recent estimate predicts that approximately 75,000 miles of highway will be kept open during the present winter.

There is little uniformity in the snow removal practices of the various states. Some place great reliance on preventive measures, such as snow fences; others have comprehensive snow fighting organizations continually on duty; others recruit temporary forces for the work; many cooperate wih bus and trolley companies, and a few, including, however, one or two of the most important states in the entire country leave the job entirely to the cities and towns.

The study of snow removal problems is being carried on continually. For example, the Michigan State Highway Department is now making a series of experiments and studies of snow conditions. An experiment station has been established at Alba where wind velocities are being measured and the effects of various types of snow fences are being watched. An account of this work will appear in the February issue of *Successful Construction Methods.*

A state which is about as well organized to fight snow as any in the country is New Jersey. The work is controlled by the state highway department and this winter it will keep open 870 miles of road. The entire state has been divided up into about fifty districts, each containing 12 to 13 miles of road which have to be kept open. Headquarters are at Trenton, where A. W. Muir is in charge at night and E. E. Reed during the day. These men keep in close touch with the U. S. Weather Bureau and with all parts of the state. The minute the snow begins to fall they call the various stations, order out the necessary snow removal equipment and the fight is on.



At left—Tractor with V-plow pushing snow off the road last winter. Below—one of New Jersey's main highways shortly after a storm

# of Modern Maintenance

Above—Hand labor is avoided wherever possible by the New Jersey authorities, but in this case it was necessary. Below—Two trucks equipped with blades clearing the road after a heavy storm

Every snow fighting unit consists of at least three trucks, two equipped with straight blades and one with a V-plow. A few tractors with V-plows are also placed at strategic points. Last winter two big Storm King rotary plows were used and this year four of these big rotaries will be on the job. They are stationed at Freehold, Princeton, Somerville and Washington and will be used wherever needed. These big plows usually do not get into action until the snow is 9 or 10 in. deep.

When the snow-fighting equipment gets under way, it keeps going continuously until the job is finished. Drifts are the greatest causes of trouble and often make necessary hand labor such as that shown in the photograph at the top of this page. This is the most expensive way to remove snow and the New Jersey authorities make every possible effort to handle the work with machines before resorting to hand labor.

New Jersey has adopted the principle that its duty is to keep the roads clean, but the state highway department never carries the snow away. It is felt that getting rid of the snow which is pushed to one side by the plows should be left to the local authorities.

Railroad and City Pave Plaza

Work Together in Putting Down Granite Blocks With Mastic Filler in Milwaukee

RAILROADS and municipalities engage in so much litigation in regard to their rights and privileges that it is refreshing to find a railroad company and a city joining hands in putting through a street paving job. The Chicago and Northwestern Railroad and the City of Milwaukee, Wisconsin, have been constructing a pavement in front of the railroad's warehouses on Jackson Street, Milwaukee. The contract for the entire improvement was awarded to one contractor, R. H. Gumz of Milwaukee, who decided to follow the same method of construction throughout. The entire yardage involved in both halves of the pavement, that which is being financed by the railroad and that for which the city is paying, is about 10,000 sq.yd.

The new pavement consists of granite block on a sand cushion, cement concrete base, and an asphalt mastic filler for use between the blocks. The accompanying photographs show clearly how the asphalt mastic is made and applied.

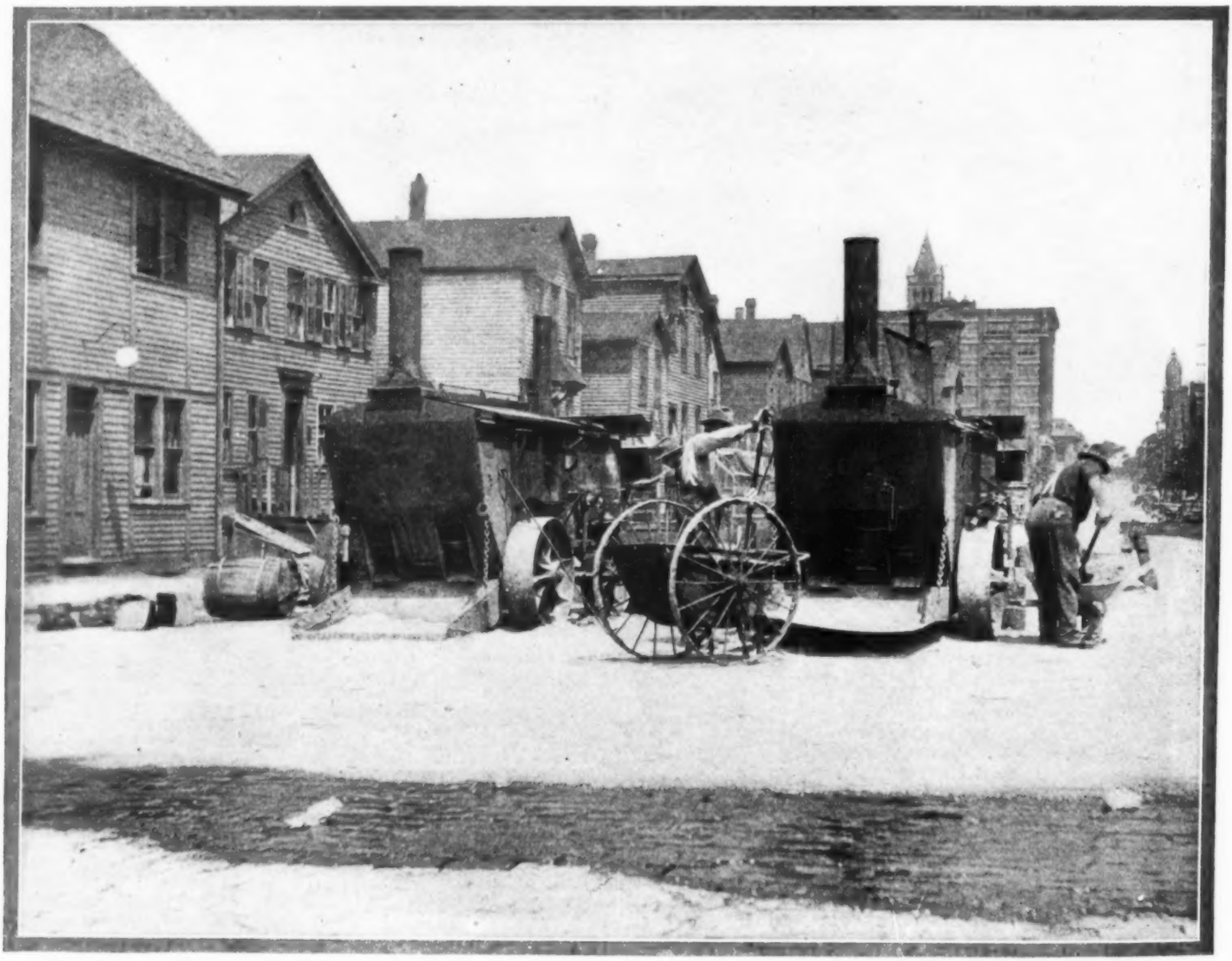
Both the materials which go into the mastic, Texaco asphalt and sand, are heated in the two pieces of equipment shown in the photograph on this page. The same temperature is required for both materials in order to obtain best results, a temperature between 350 and 375 degrees Fahrenheit.

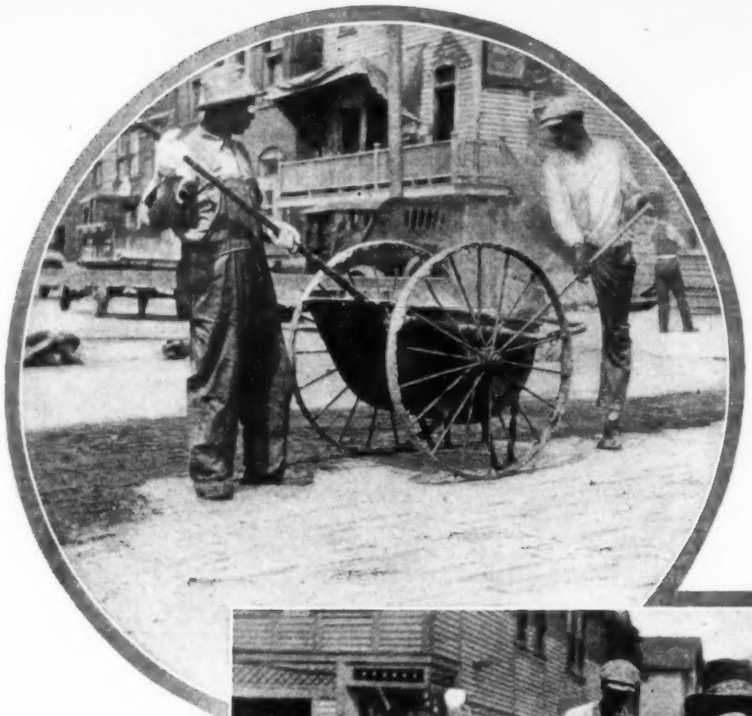
After the asphalt and sand are properly heated, they are mixed in a cart with hoes, as shown in photograph at the top of the opposite page. Equal parts of the asphalt and sand by volume are employed in the mixture.

In the meantime the granite blocks have been put in place and a hand roller used to imbed them properly in the sand cushion. The Texaco asphalt mastic filler is poured over the surface of the block by a squeegee. Coarse sand is then spread over the surface, and the pavement is ready for use.

In order that the routine of the railroad warehouses located next to the pavement should be interfered with as little as possible, the construction of the pavement was divided into three parts. The north third of the street was completed first, then the southern third and finally the central sections.

Heating sand and asphalt together to form mastic filler





The three photographs on this page show in detail the method used in applying the mastic filler on the granite block pavement. The photograph at the left shows the mastic filler being mixed with hoes in the carts before being poured on the pavement. In the center photograph the filler has just been poured on the granite blocks and is being worked into the joints between the blocks with a squeegee. The heating equipment may be seen in the background of this photograph

The photograph at the right shows one of the men with a squeegee spreading the mastic filler and gradually working it down between the blocks. As soon as this process is completed, coarse sand is thrown over the surface and the pavement can be used immediately. This sort of filler sets very quickly and that is one of the chief reasons it is used. It was deemed most important for this particular job where it was necessary to keep the way to the warehouses open to traffic almost continuously

Eastern Maintenance

The Best Highway in the World Deteriorates if It Is Not Properly Maintained. All of the Maintenance Photographs on This Page Were Taken in the Older States East of the Alleghenies

Painting traffic line

In northern Massachusetts

In oval—Pulling stumps with tractor in New Hampshire

Stock piles on New York highway

Erecting Pennsylvania guard rail

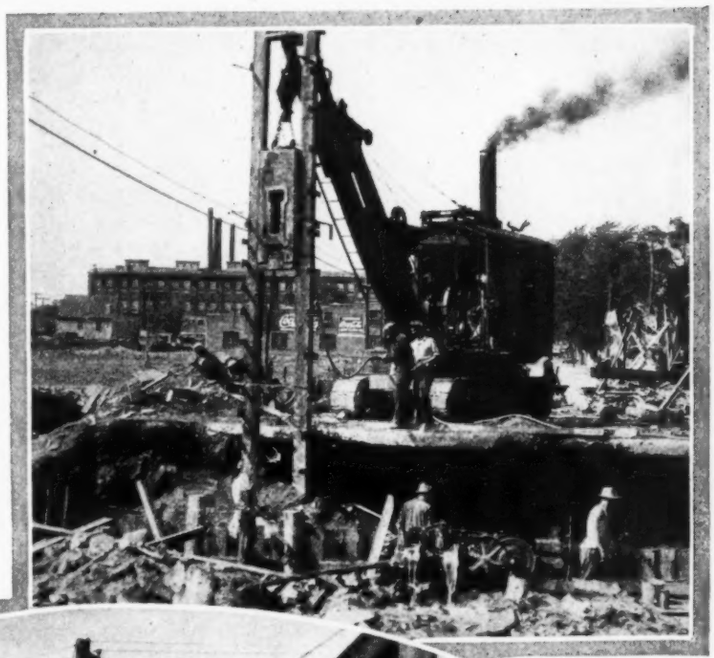
Portable crushing plant on a North Carolina highway

Steam Shovel and Hammer Drive Piles

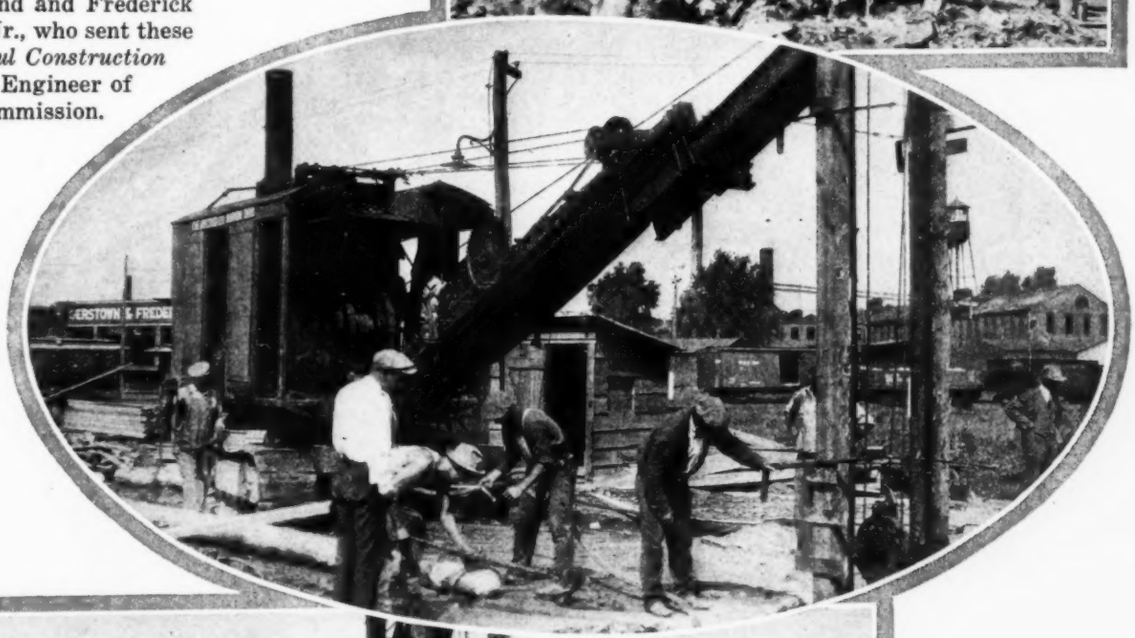
Team Up to Handle Emergency on Maryland Bridge Job

IN BUILDING a bridge across Carroll Creek in Frederick, Maryland, the unexpected discovery was made that a pile foundation was necessary. In that section of the country where practically the entire territory is underlaid with rock, a pile driving outfit is a rarity, so it was decided to rig up some other outfit for driving the piles. A locally owned Osgood steam shovel was obtained, and a Union steam hammer was imported from Baltimore by truck. Leads for the hammer were designed and built by superintendent Charles Cunningham of the Concrete-Steel Bridge Co. of Clarksburg, W. Va., the contractors. The photographs show clearly how the outfit operated. In five days 85 piles with a cut-off length of 1,557.6 lin.ft. were driven to resistance.

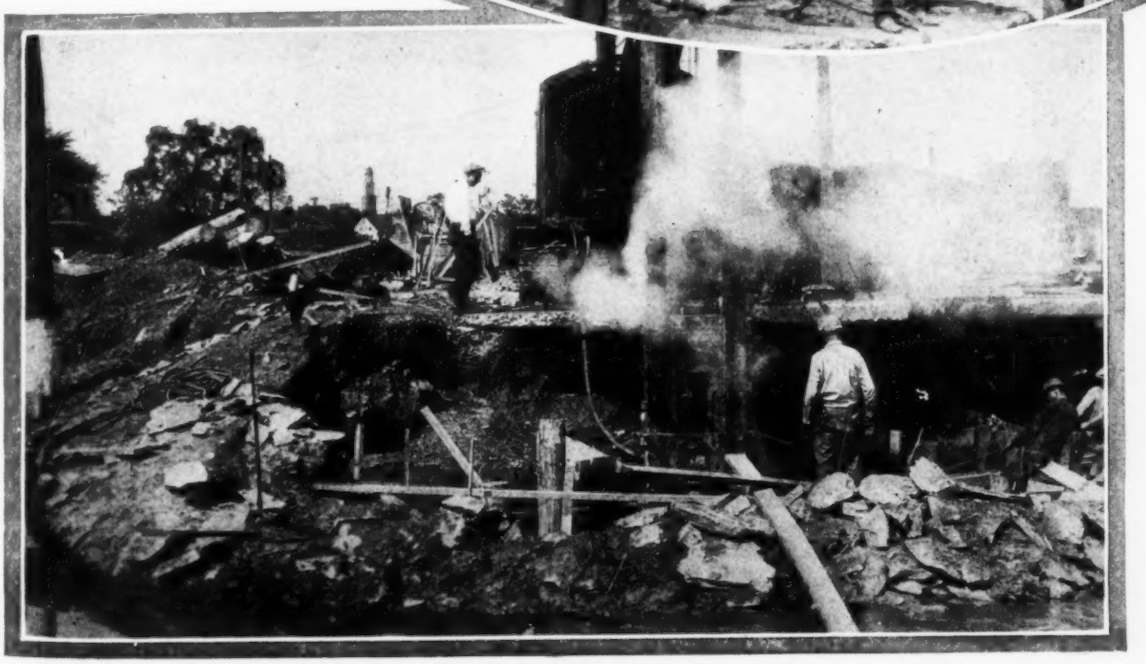
The bridge is being constructed by the State of Maryland and Frederick City. W. F. Childs, Jr., who sent these pictures to *Successful Construction Methods*, is District Engineer of the State Roads Commission.



Adjusting leads over pile with hammer in raised position



Boom of steam shovel was extended as shown in this photograph



Steam hammer operated by steam from shovel driving one of the piles

Juniata Boys Dig In at King of Prussia

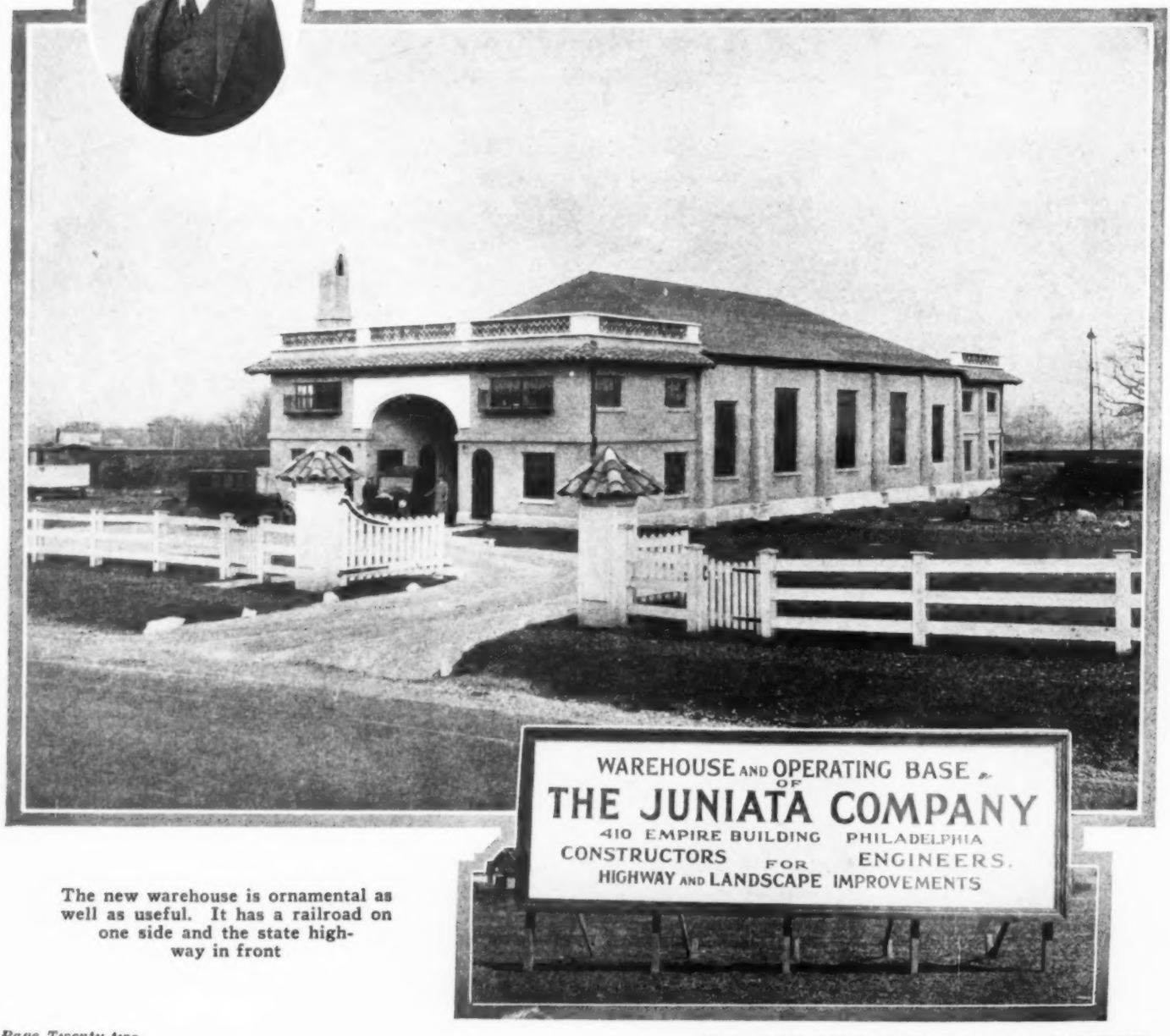
New Warehouse Designed and Built by Paving Company Men Is First Unit of Group

THE Juniata Company, which in the last few years has done paving work in five states along the Atlantic seaboard, is building a permanent home at King of Prussia, Pennsylvania, a short distance outside Philadelphia. A triangular piece of land was purchased by the company, and the first unit of what will ultimately be a company colony has just been finished. This building is a warehouse designed and built by men in the employ of the Juniata Company. Plans have now been drawn for a cottage dormitory in another corner of the lot and ultimately it is probable that a number of homes will be built for Juniata men.

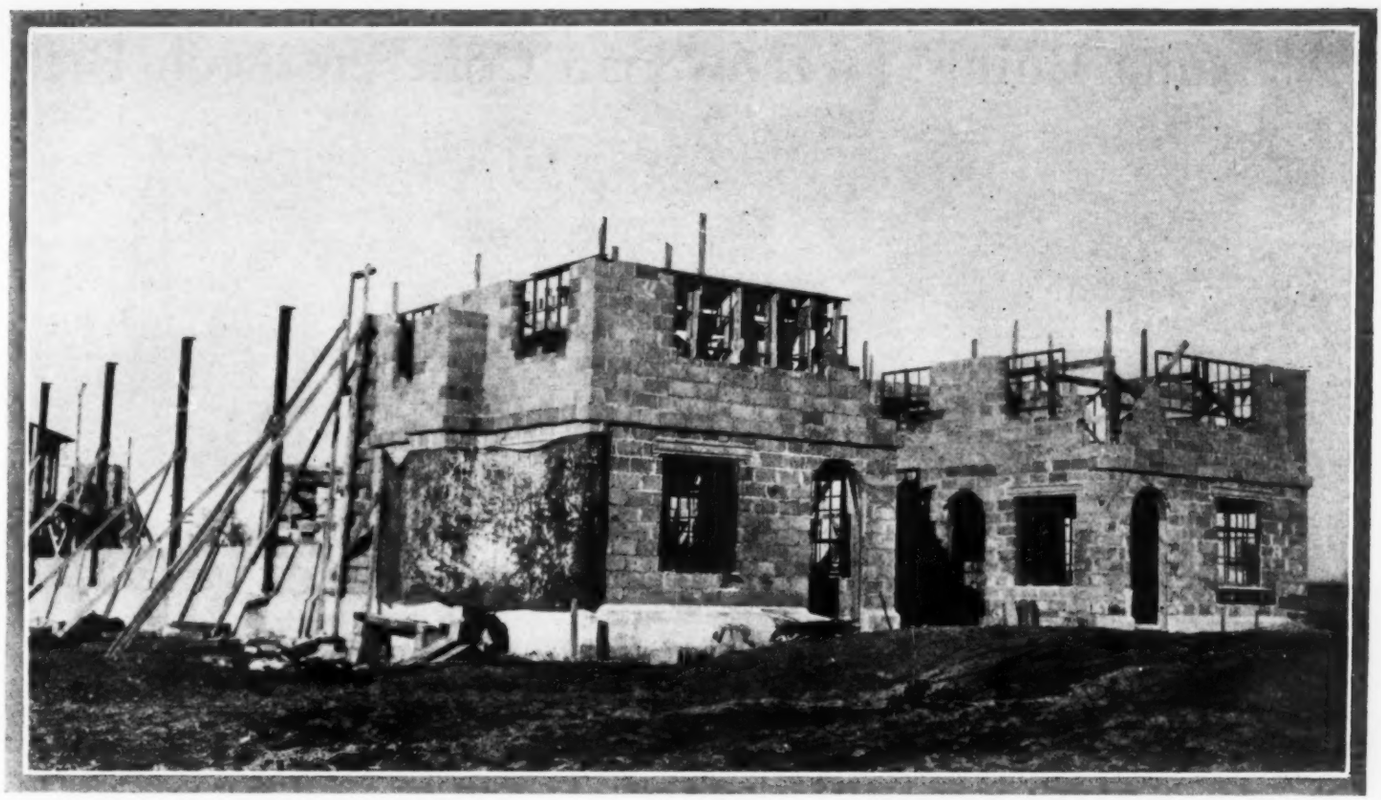
The warehouse which has just been finished is 112 ft. long and 52 ft. wide and later on will be made part of a double building, the other structure to be 140 ft. by 60 ft. The plans for the warehouse were drawn in the offices of the Juniata Company during the winter season when the company's organization had considerable spare time, and the additional work planned will probably occupy the men in the Juniata office for several winters to come.

The three men primarily responsible for the buildings as planned are R. C. Jacob, president of the company, and Joseph L. Ingle and James D. Martin, both employed in the Philadelphia office. Work began on the warehouse about a year ago. All of the work, with the exception of the erec-

R. C. Jacob, President of the Juniata Company, is shown in the oval



The new warehouse is ornamental as well as useful. It has a railroad on one side and the state highway in front



The work shown in this photograph was done by road builders

tion of the steel, was done by Juniata men. Superintendents, foreman and ordinary laborers joined in laying cinder block for the walls and kept busy until it was time to get back to paving again.

The warehouse is a substantial structure of pleasing appearance. Over the doorway is a concrete arch bearing a design emblematical of the paving industry, including steam shovels, cranes and other road building machinery. At the present time the equipment used by the Juniata company on its various jobs last summer is being brought into the warehouse for repairs and winter storage.

As may be seen in the photograph at the bottom of page 22, the building is close to a railroad and ultimately a siding will probably be run right into the building. The door in back has been designed for this purpose.

Mr. Jacob feels that by establishing this permanent home for the company he will increase the solidarity of the organization. Since the company has established itself in King of Prussia, it has picked up a considerable number of small jobs in the immediate vicinity which help greatly in taking care of the overhead during the slack periods of the year.

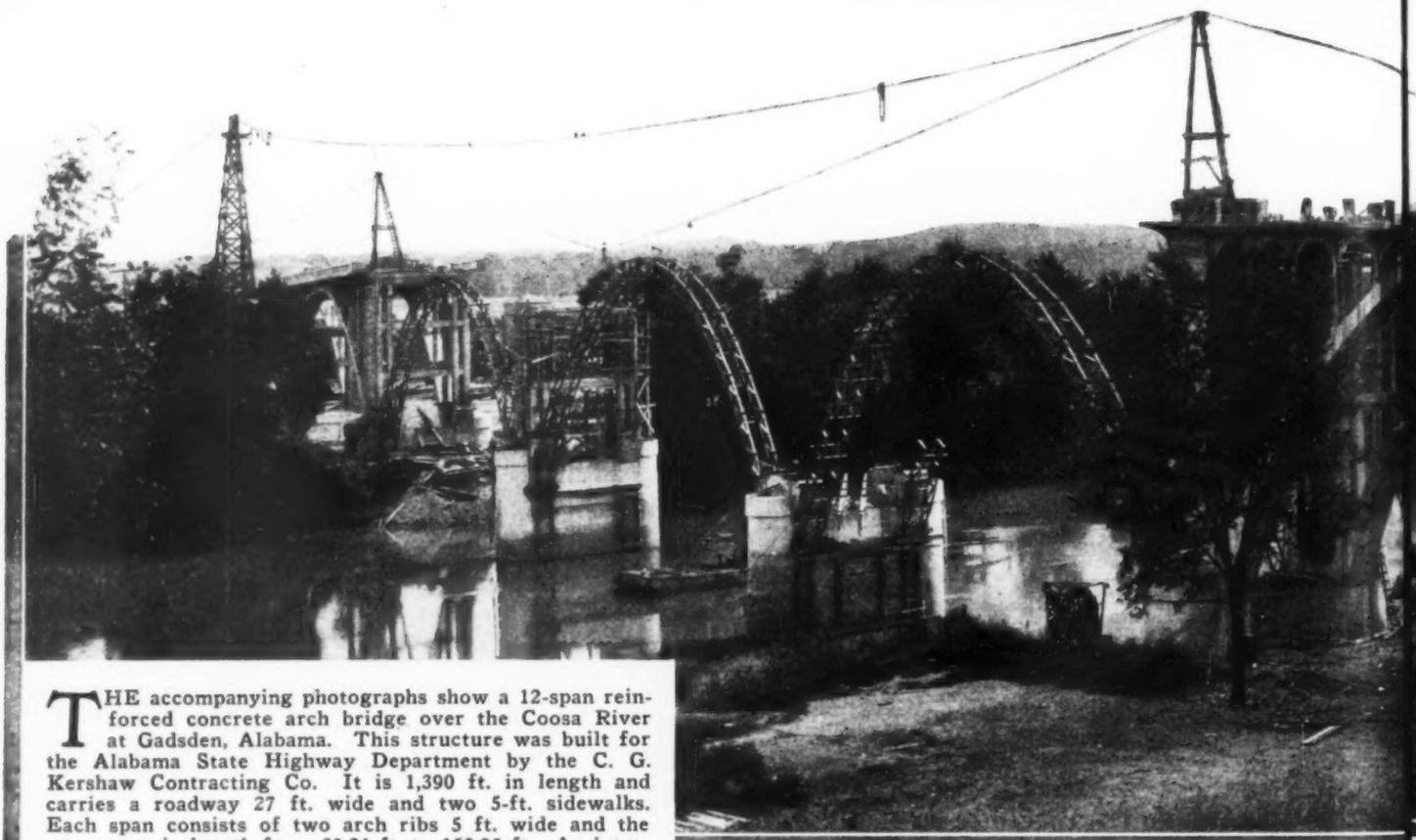
With the Marine Division

A TRIO of amphibious road builders occupy the bottom of this page. The first of them is a Barber-Greene ditcher operating in the Atlantic Ocean near Miami, Florida, where it was engaged in the job of cutting a 15-in. trench for a bulkhead built to keep the tidewater and the whitecaps from splashing over a new boulevard.

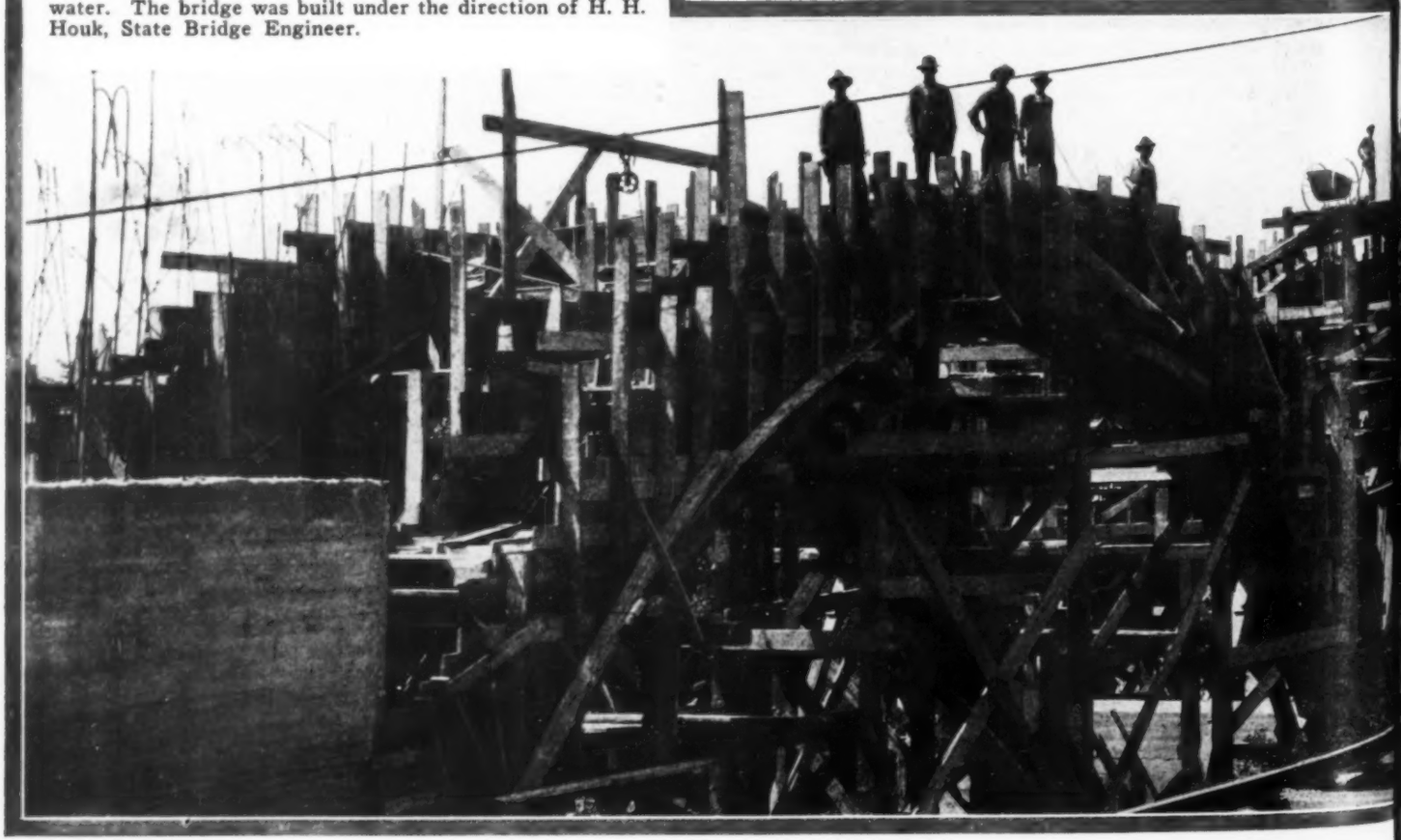
The picture in the center shows a P & H shovel emulating General George Washington by crossing the Delaware. This shovel, which is owned by Joseph Walker, a contractor who is building a road for the New York State Highway Department, in the upper reaches of the Delaware valley, was unloaded at a railroad station on the Pennsylvania side. There was no bridge for several miles in either direction strong enough to support the shovel, so it waded into the stream and made its own way across. The operator didn't even get his feet wet.

The photograph at the right was taken on a road job in Maryland where the going through a swamp was so heavy that oxen had to be used for some of the grading operations. At the moment this particular photograph was taken, even the oxen had found a water hole that was too deep for them to navigate.

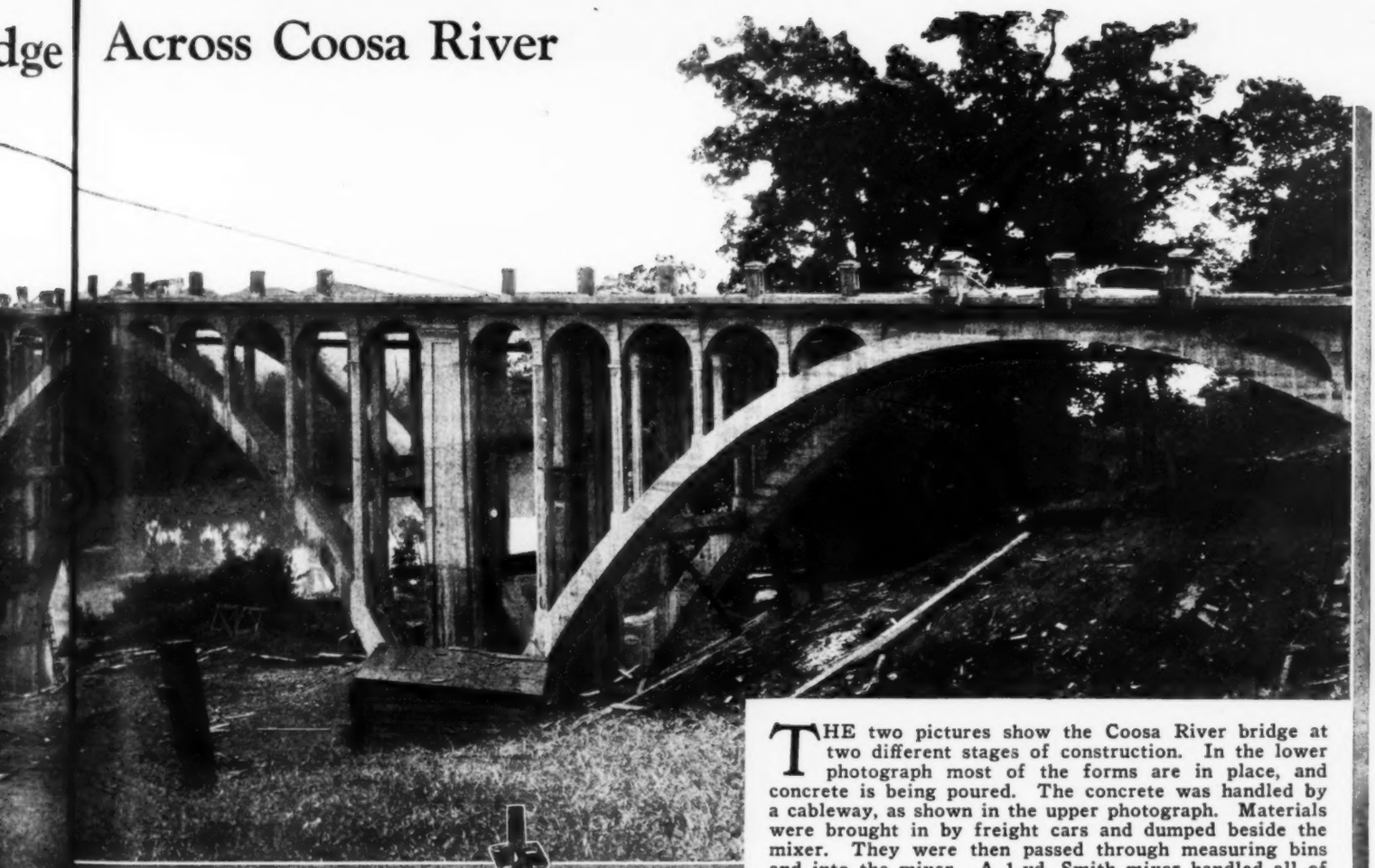
Alabama Builds Twelve-Span Concrete Arch Bridge

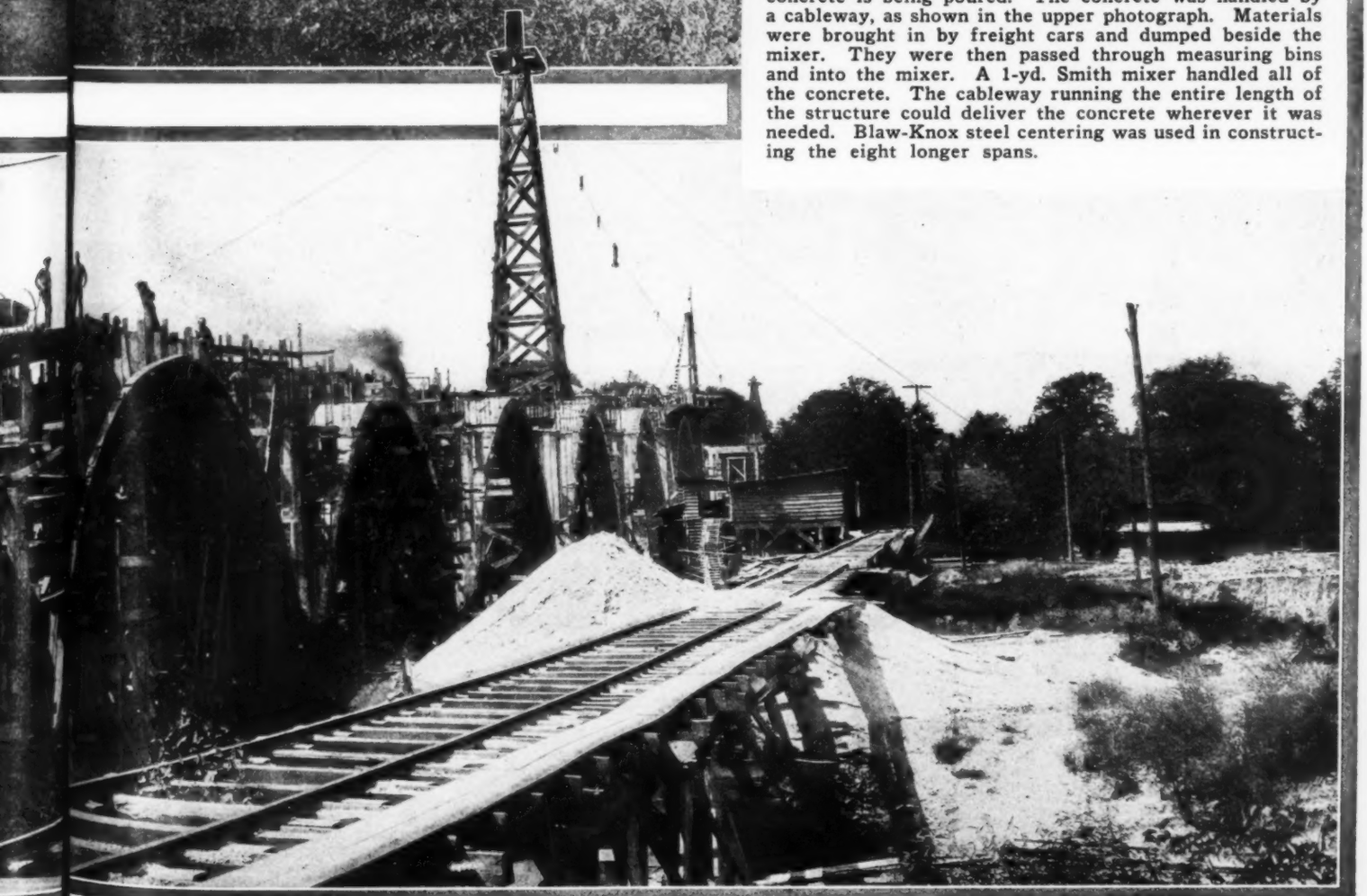


THE accompanying photographs show a 12-span reinforced concrete arch bridge over the Coosa River at Gadsden, Alabama. This structure was built for the Alabama State Highway Department by the C. G. Kershaw Contracting Co. It is 1,390 ft. in length and carries a roadway 27 ft. wide and two 5-ft. sidewalks. Each span consists of two arch ribs 5 ft. wide and the spans vary in length from 62.24 ft. to 150.95 ft. An interesting feature of the design is the comparative height of the arches. They reach a height of 80.75 ft. above low water. The bridge was built under the direction of H. H. Houk, State Bridge Engineer.



Across Coosa River





THE two pictures show the Coosa River bridge at two different stages of construction. In the lower photograph most of the forms are in place, and concrete is being poured. The concrete was handled by a cableway, as shown in the upper photograph. Materials were brought in by freight cars and dumped beside the mixer. They were then passed through measuring bins and into the mixer. A 1-yd. Smith mixer handled all of the concrete. The cableway running the entire length of the structure could deliver the concrete wherever it was needed. Blaw-Knox steel centering was used in constructing the eight longer spans.

Concrete Slabs Replace Toothing

Precast Blocks Used Instead of Stone and Brick in Repairing Pavement by Salt Lake City Traction Company

A SUBSTITUTE for stone and brick toothing along street railway tracks has been developed in Salt Lake City. It is being used there in repairing asphalt pavement along the Utah Light & Traction Company's track, and it has lately been approved by the Union Pacific for use on grade crossings. Precast concrete slabs, 4 ft. by 1 ft. and of a thickness to conform with the size of rail, are taking the place of toothing. The accompanying pictures illustrate some work on Second Street West done last summer. On this section the rail is A.S.C.E. 65 lb., $4\frac{7}{8}$ in. high. The slabs are $3\frac{3}{4}$ in. thick. They were laid on a concrete bed which put them on a level with the top of the rail. The slabs on the inside of the rail are beveled to make a flangeway. Indented slabs are used at continuous rail joints. Carey Elastite rail filler is inserted between block and rail, and an asphalt mastic makes the joints. Air hammers, run by a portable compressor taking current from the trolley wire, are used to cut the trench in which the blocks are laid, the pavement being cut back to a uniform distance of 14 in. from the rail. The slabs are wheeled into position on a buggy, which can be seen in the photograph at the bottom of this page, and are set in wet concrete. An expansion joint not less than $\frac{3}{4}$ in. wide is left between blocks, and the joints are staggered. This block paving was put in at a cost of about $1.35 per foot of single track.

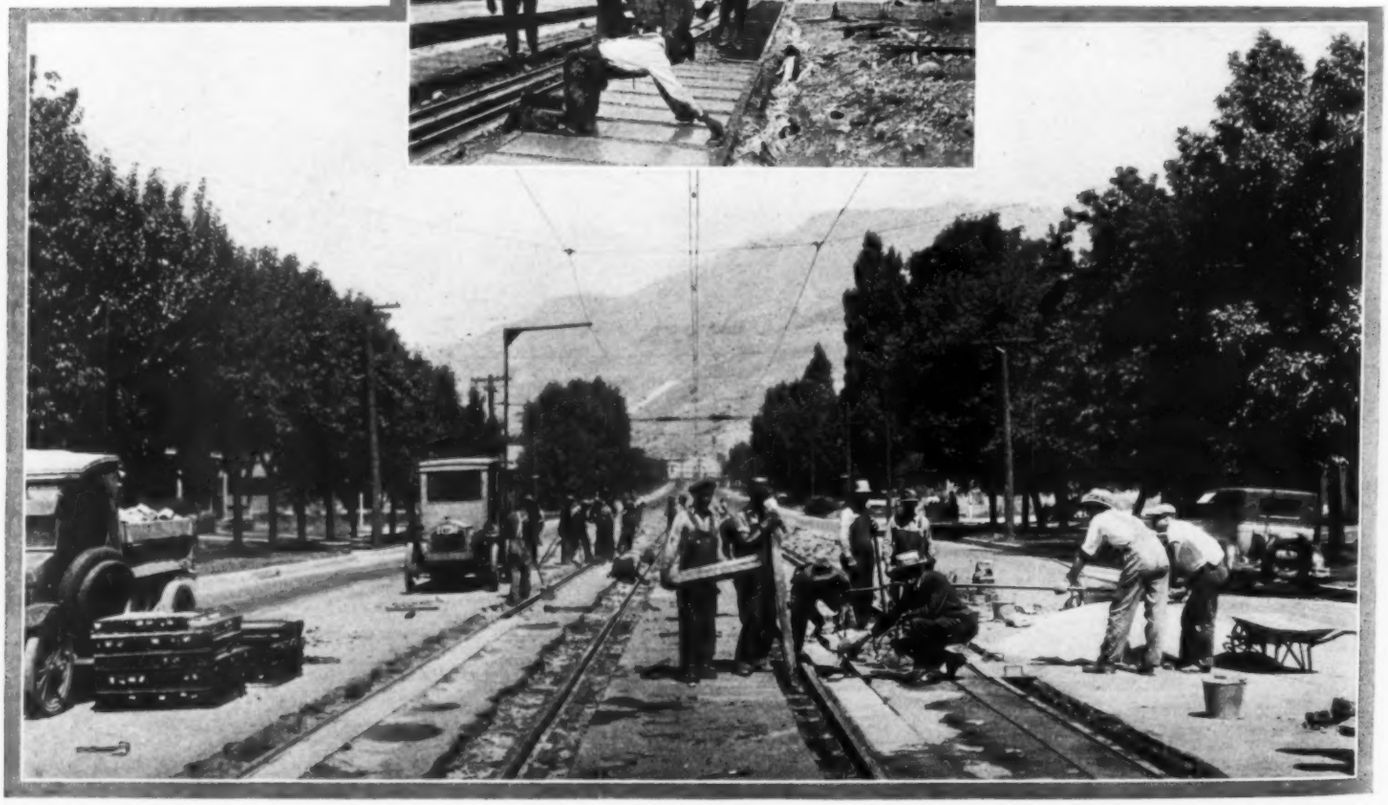
The upper photograph on this page shows blocks being poured. Two $\frac{3}{8}$-in. rods, spaced on 4-in. centers, are used in the block. They are not put in for reinforcing but are intended to hold the block together in case cracks develop. A 1:1½:3 mix, with crushed gravel aggregate and a minimum of water, is used. The blocks are kept wet 28 days. At the end of this period, they have an average crushing strength of 5,100 lb. per sq.in.

The concrete slabs have a number of advantages over the old brick and stone toothing. Not the least of these is the ease of replacement. The use of slabs eliminates a number of joints, and the slabs are not affected by frost. Asphalt pavement adjoining them does not crack and ravel. About 2½ ft. of asphalt pavement in the middle of the track is saved when repaving is done with concrete slabs instead of stone block.

These concrete slabs were developed by L. L. Dagron, chief engineer of the Utah Light & Traction Company. Mr. Dagron made his first slabs in 1908. The ones in use today present very few modifications.

At right—Pouring the precast concrete slabs. Concrete is brought from the mixer in small dump car

Below—Setting the slabs along rails in city streets. A long handled two-wheeled buggy is used



The upper photograph shows a portable compressor and workmen cutting away ragged edge of old pavement to make room for concrete slabs. The right-hand photograph shows the joints between blocks being filled with a mastic of asphalt and sand and then tamped. The picture at the bottom of the page shows the concrete slab being laid along the trolley rails in one of the main streets of Salt Lake City

The Deep Dark Thoughts

1—"We start off nicely. Weather is good and digging is easy."

5—"Taking out the rock isn't so bad as they said it would be."

2—"Even a few stumps don't bother us much."

3—"Of course there is some heavy going."

6—"Though they make us do a pretty smooth job."

7—"But when it rains, we're up against it."

4—"But when the rock is uncovered, the drilling is not very hard."

8—"The mules slip and the wagons get stuck."

...ts of a Hard-Boiled Shovel

9—"Why, the other day a team was completely laid out."

13—"And then it snows a little just to make life interesting."

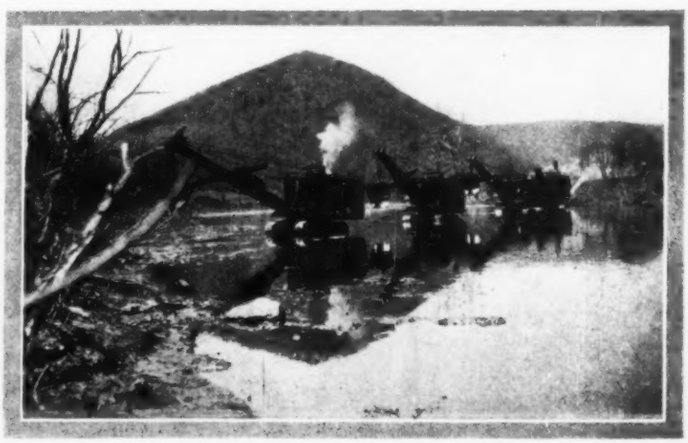
10—"We pulled one big fellow out with the snatch team."

11—"The farmers need rain but we don't. See the slides."

14—"But in spite of all this we get the job done."

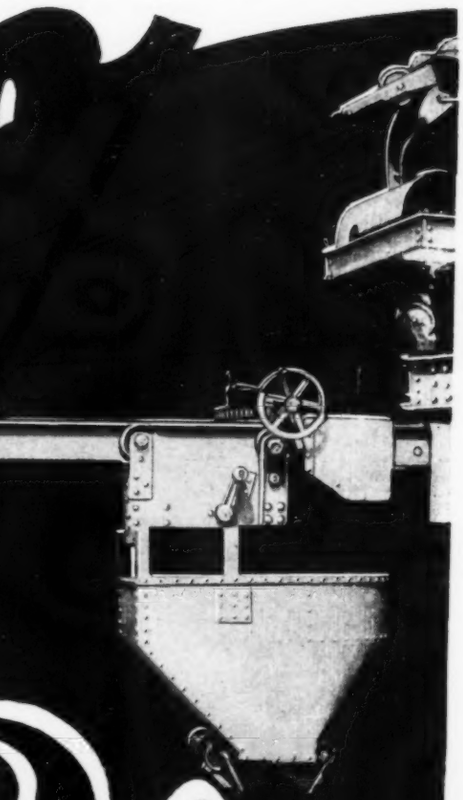
15—"In fact, we think it's a pretty good looking job."

12—"And they raise Hell with our grade."



16—"And now we're off to the next job. We always hope it will be a better job—but it never is!"

100%



27 E

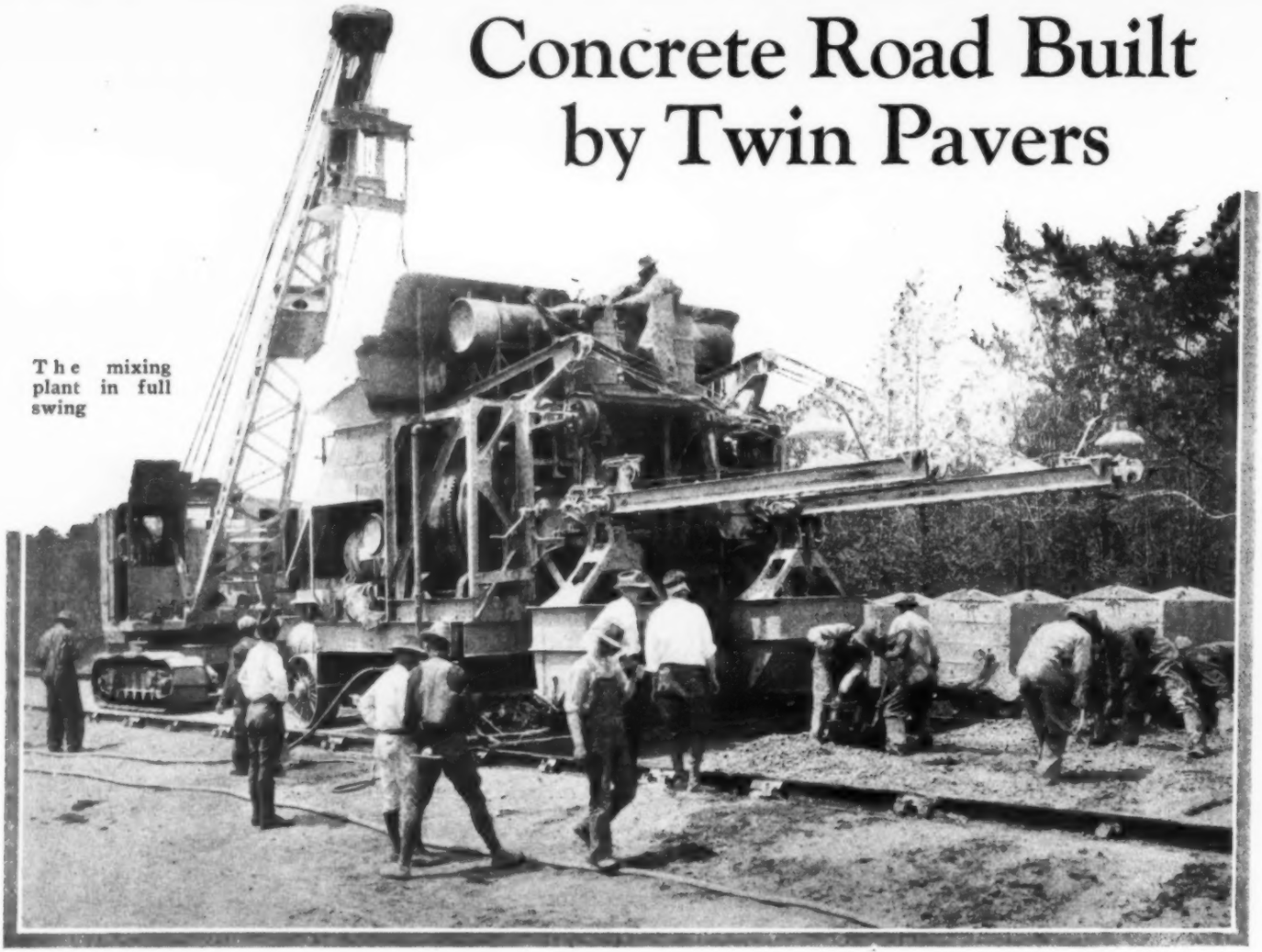
Ransome

RANSOME
DOMESTIC
REPRESENTATIVES

ALBANY, N. Y.
Sager-Spuck Supply Co. Inc.
ASHEVILLE, N. C.
North State Culvert & Machinery Co.
ASTATULA, Fla.
Prescott Machinery Co.
ATLANTA, Ga.
Henry G. Williams
BALTIMORE, Md.
Giles & Ransome
BIRMINGHAM, Ala.
Smith-Meadow Supply Co. Inc.
BOSTON, Mass.
The Clark-Wilcox Co.
BROOKLYN, N. Y.
John P. Fitzgerald
BUFFALO, N. Y.
The Wheeler-Murray Co.
BUTTE, Montana
Western Supply Co.
CANTON, Ohio
J. C. Neely & Co.
CHARLESTON, W. Va.
Capital City Supply Co.
CLARKSBURG, W. Va.
Clarksburg Supply & Equipment Co.
CHARLOTTE, N. C.
W. Fred Casey Co.
CHATTANOOGA, Tenn.
Connor Sales Company
CHICAGO, Ill.
Ransome Concrete Machinery Co.
CLEVELAND, Ohio
E. T. Fegx Co.
COLUMBIA, S. C.
Fred D. Marshall, Inc.
COLUMBUS, Ohio
John McNeilly
DALLAS, Texas
J. W. Barthalow Co.
DAVENPORT, Iowa
Allen B. Bondinot
DENVER, Colo.
Clinton & Held Co.
DETROIT, Mich.
W. H. Anderson Tool & Supply Co.
EL PASO, Texas
Rue L. Johnson
JACKSONVILLE, Fla.
Stanley & Gill Machinery Co.
LOS ANGELES, Cal.
Ensick & Co.
MEMPHIS, Tenn.
Pidgeon Thomas Iron Co.
MINNEAPOLIS, Minn.
Wm. H. Hale & Co.
MOBILE, Ala.
Lawrence-Goodling Co. Inc.
MONTREAL, Canada
Canadian Equipment Co.
NASHVILLE, Tenn.
R. L. Stockard
NEWARK, N. J.
Johnson & Dealaman, Inc.
NEW HAVEN, Conn.
The Clark-Wilcox Co.
NEW ORLEANS, La.
Ole K. Olsen
NEW YORK, N. Y.
Fitzgerald & Hudson
NORTHPORT, N. Y.
F. G. MacDonald
PHILADELPHIA, Pa.
Giles & Ransome
PITTSBURGH, Pa.
Euane Machinery Co.
PORTLAND, Ore.
McCraken-Ripley Co.
RICHMOND, Va.
Ed. P. Phillips
ROCKFORD, Ill.
Swords Bros. Co.
SAN ANTONIO, Texas
Brandt Iron Works
SAN FRANCISCO, Cal.
Ransome & McClelland, Inc.
SEATTLE, Wash.
Washington Machinery & Storage Co.
SPOKANE, Wash.
General Machinery Co.
SPRING LAKE, Mich.
W. H. Anderson Tool & Supply Co.
ST. LOUIS, Mo.
Central Equipment Co.
SYRACUSE, N. Y.
The Wheeler-Murray Co.
TAMPA, Fla.
Tampa Machinery Co.
TOLEDO, Ohio
National Supply Co.
TORONTO, Ontario.
Clare Osborn Ltd.
VANCOUVER, B. C.
B. C. Equipment Co.

RANSOME
Master
Paver
RANSOME
REG. U.S. PAT. OFF.
AMERICA'S
FIRST MIXER

Concrete Road Built by Twin Pavers



The mixing plant in full swing

THE completion of nearly 39 miles of 8:7:8-in. concrete road slab, 18 ft. wide, in a single season with one paving outfit is the record just established in North Carolina by James O. Heyworth, Inc., of Chicago.

The work done consisted of two jobs, one 29.8 miles long, and the other 8.7 miles in length. The longer job was finished first. Then the outfit was moved about 35 miles to the single set-up on the shorter one.

The unit of equipment used which set the pace for the season was a specially designed twin 32-E Koehring paving mixing plant. This plant has two 32-E paving mixer drums mounted side by side at the same level on a built up structural steel frame. The frame, in turn, is mounted on four crawler treads, two under each drum, and on two pair of wide tire steel wheels. The latter may be slewed so that the truck may be guided in moving.

The twin idea is carried right through on the plant. Each drum is driven by an individual gas engine. Each drum also has its own fixed charging hopper set above it in the frame of the plant. A separate standard water supply tank serves each drum. A boom and bucket also are provided for each drum. The whole arrangement of the plant thus is such that either drum may be operated entirely independent of the other.

There is no drive on the truck carrying the mixers. Traction for the plant is provided by a standard Koehring 30-ton gasoline crane mounted on crawler treads. This crane is hooked by a pin connection to a tongue between the pairs of wide tire wheels on the gears of the truck of the mixing plant. The crane can move the plant in either direction.

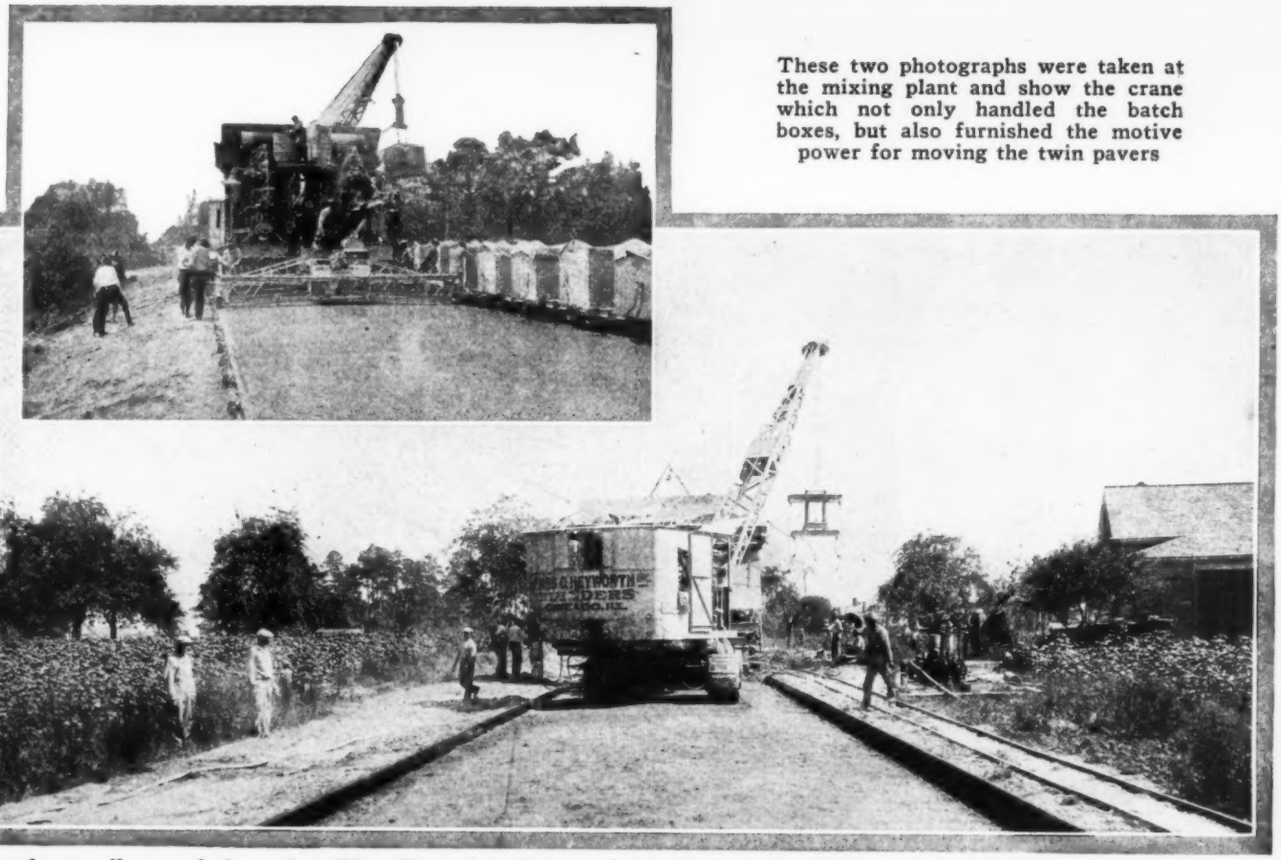
The cement, sand and stone for the concrete were delivered to the mixing plant in batch boxes on flat cars operated over narrow-gage track from a central material-handling plant. On the longer job this material-handling plant was set up successively at four different points. Each set-up was on a siding from a main-line railroad. Each set-up also was about midway on a section of the work, so that materials could be delivered about equal distances in both directions from the plant.

One of the photographs shows one of the set-ups. The others were arranged in much the same way. In the view shown there may be seen four Blaw-Knox steel bins alongside the standard-gage railroad siding over which the materials were delivered.

Two locomotive cranes, each equipped with a 1-yd. clamshell bucket, unloaded the sand and stone from the railroad cars to the bins or to stock piles for rehandling to the bins. Two narrow-gage tracks extended the length of the set-up, which was from 1,000 to 1,200 ft. One of these narrow-gage tracks was laid under the bins, so materials could be loaded from the latter to the batch boxes by gravity. The other served as a passing track.

Fifteen-car trains were operated on the narrow-gage track by 6-ton Whitcomb gasoline locomotives, which had seen three years service previous to this job. The driver and one brakeman made up each train crew.

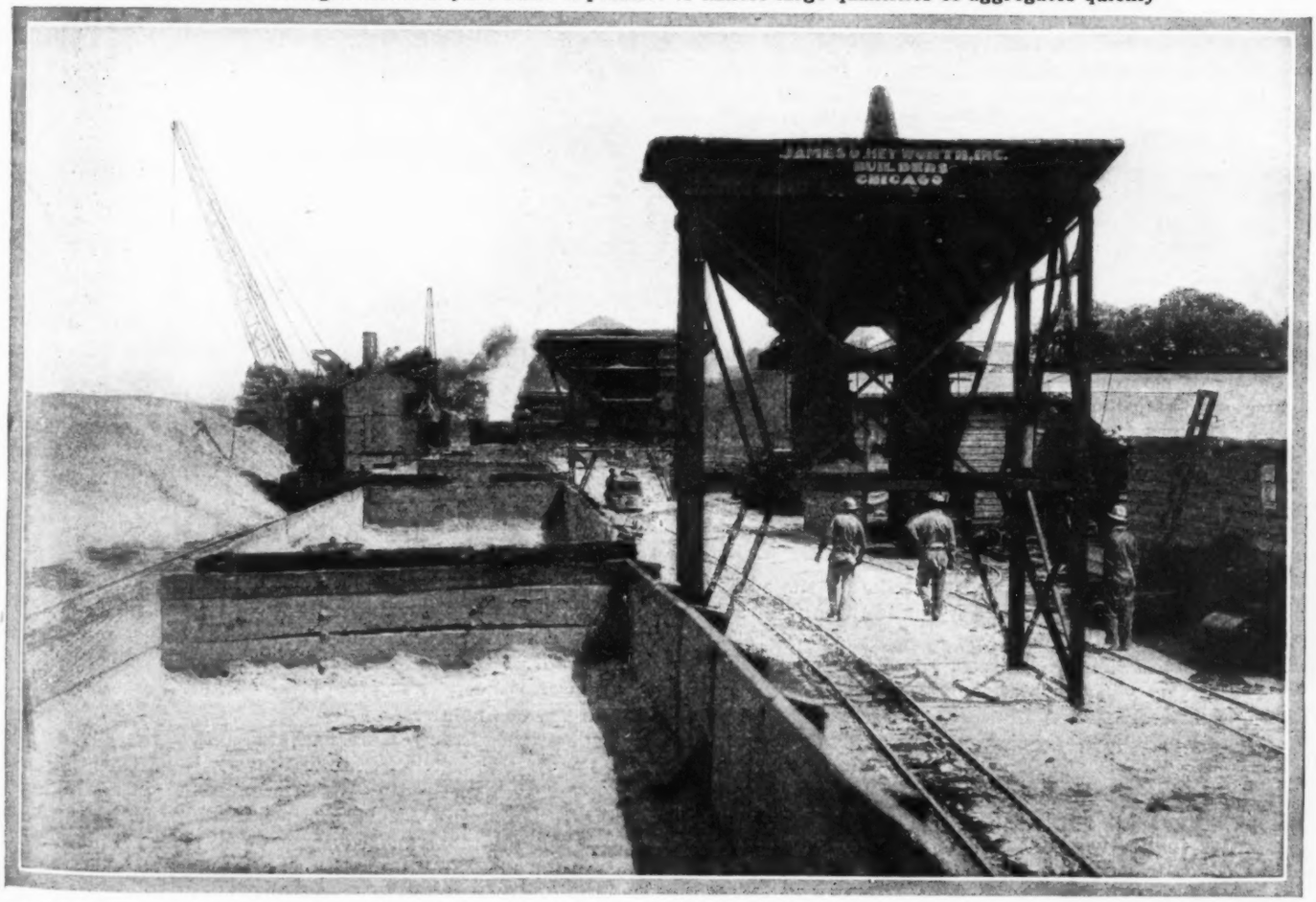
On an average, two fifteen-car trains were required to each mile in distance from the material-handling plant to the mixing plant, plus one extra train. The loaded trains were given the right-of-way. Stub switches were placed from 600 to 800 ft. apart in the vicinity of the mixing plant.

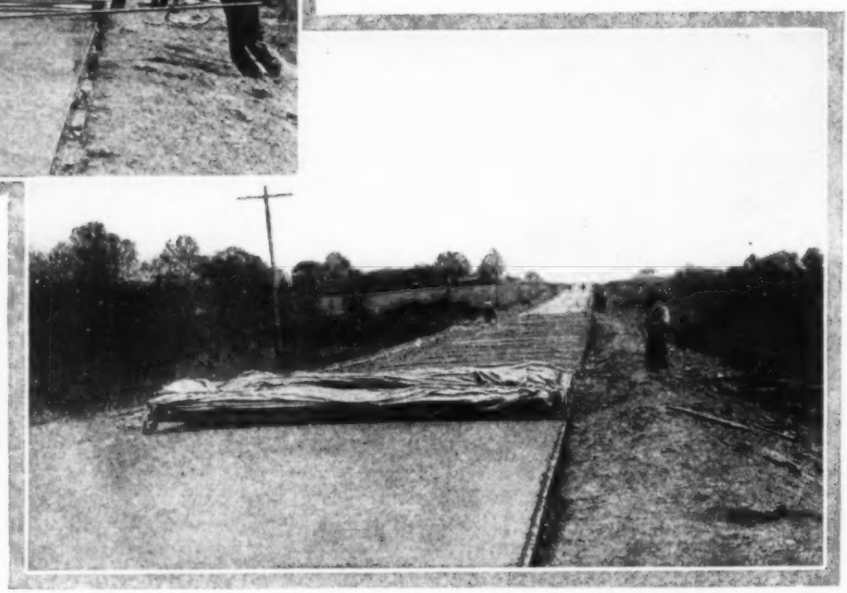


These two photographs were taken at the mixing plant and show the crane which not only handled the batch boxes, but also furnished the motive power for moving the twin pavers

The sand was all passed through a Blaw-Knox inundator at the material-handling plant. This required the cement to be placed on top of the load. In order to prevent loss from wind or derailments, the cement was left in the sacks until the train reached the vicinity of the mixing plant. There a crew of six men was used to empty the sacks.

This well arranged material yard made it possible to handle large quantities of aggregates quickly





The North Carolina specifications require an extremely smooth finish. The longitudinal float shown in the upper photograph was handled with long poles. Burlap was used to cover the concrete during the curing period as shown in the lower picture

This was done either while the train stood waiting to get in alongside the mixing plant, or at the latter. This crew saved, it was estimated, more cement than it cost to maintain it.

The crane at the mixing plant lifted one batch box at a time from the train alongside to one or the other of the two fixed charging hoppers over the mixing drums. The long boom on the crane permitted great flexibility in the location of the narrow-gage track along the side of the road. This was due to the fact that the crane could easily reach 10 to 15 ft. below or above grade and well out to one side.

The rough grading for both contracts had been completed long in advance of the laying of the slab. In some cases it had washed considerably, or was rutted by travel, or both. There was thus usually considerable fine grading to be done. In order to get an average for the whole season of over 1,050 linear feet per day ready for the slab, there was required what might appear to be a rather extensive lot of grading equipment.

The shaping up of the grade was first done with an Austin 10-ft. blade grader pulled by a Model 60 Caterpillar tractor. Behind this came a Model 30 Caterpillar tractor with a 5-ft. blade grader dressing down closely. The steel forms were then set with a Carr formgrader, after which a Lakewood subgrader was used to polish off.

A gang of ten men worked on the grade at the discharge end of the plant. Two of these worked along a weighted grade board dragged by the plant. The other eight saw to it that the concrete was properly distributed along the forms and over the grade, no small job when 3 tons were dropped in front of them every minute for much of the time.

A Lakewood screed was used to strike off the surface of the slab. Finishing was done by hand, first with a longitudinal float and then with a cross belt. Under the specifications of the North Carolina State Highway Department practically no variations in surface finish are permitted. This was accomplished in the manner mentioned with a total gang of 8 men.

Curing of the slab was much simplified by the use of calcium chloride. According to the specifications, 3 gallons of a solution of 100 pounds of calcium chloride in 30 gallons of water in hot weather, and 25 gallons in cool weather, were added to each batch. The finished slab was then covered with burlap and sprinkled until the initial set had occurred. The maximum elapsed time required for this did not exceed 24 hours. The amount of water needed on the job was thus much reduced.

Water for mixing and sprinkling was obtained from various streams along the work. A C. H. & E. standard gasoline-engine-driven triplex pump delivered the supply through a 2-in. line.

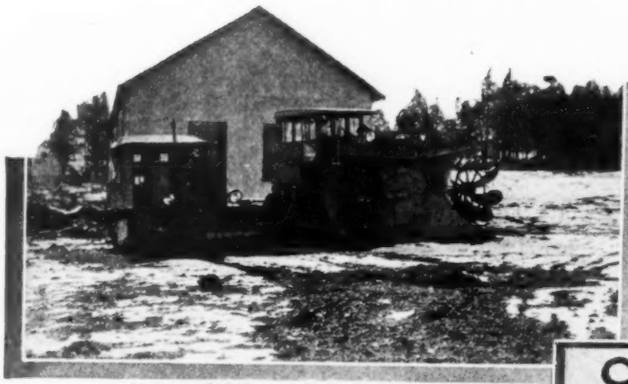
The layout of equipment described made its best records over long periods. The specifications required a 1½-minute mix. This would have theoretically permitted a batch a minute from the mixing plant. It was impracticable, however, to keep materials flowing to the mixing plant steadily enough to permit this rate to be maintained. In other words, transportation was the controlling factor.

Some very high rates for short periods were obtained. For example, 200 lin.ft. an hour, or 400 sq.yd. was not at all uncommon. The best day's run was 1,695 lin.ft. or 3,390 sq.yd. in 11 hr. The best consecutive five days' run was 9,343 lin.ft. or 18,686 sq.yd. in a total of 97 working hours. At another time 7,229 lin.ft. or 14,458 sq.yd. were laid in a consecutive 5-day period, working 47 hours. This averaged over 300 sq.yd. per hour. This means that 20 to 30 railroad cars of 50 tons each had to be unloaded every 24 hours. Not some days, but every working day for months and months. On an average, more than 125 loaded railroad cars were always enroute to the material-handling plant from various points.

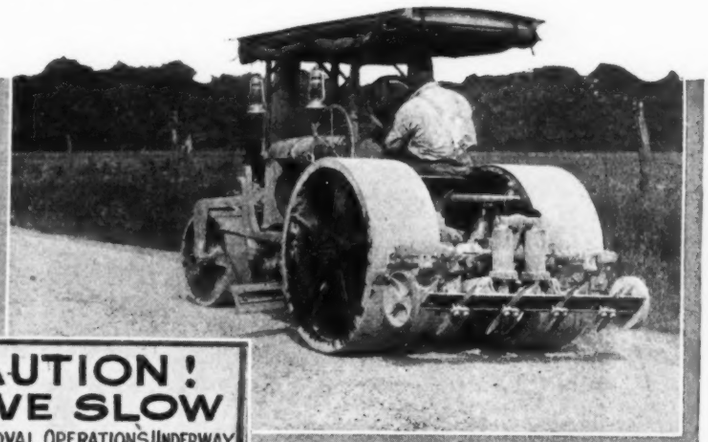
The two contracts were executed under the supervision of the North Carolina State Highway Department, Frank Page, chairman, and L. R. Ames, acting state highway engineer. James O. Heyworth personally made the general layout of the plant and equipment and closely followed the operations. G. H. Shure is superintendent in charge for the contractor.

Western Maintenance

The Outfits Shown on This Page Are Typical of the Maintenance Units in the Western Part of the United States. Hard and Continuous Service Is the Rule for These Machines



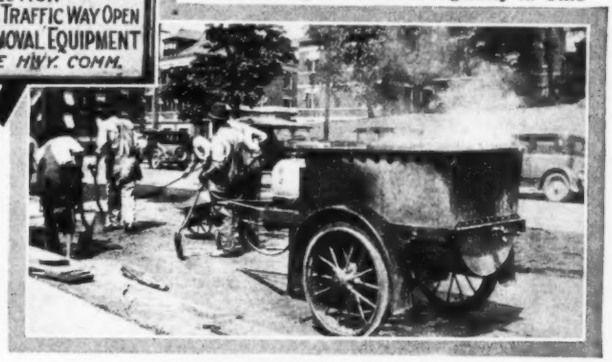
A snow-fighting unit in Oregon



Resurfacing the Lincoln highway in Ohio

CAUTION!
DRIVE SLOW
SNOW REMOVAL OPERATIONS UNDERWAY
ON THIS SECTION
THERE MAYBE ONLY ONE TRAFFIC WAY OPEN
WATCH OUT FOR SNOW REMOVAL EQUIPMENT
By Order ORE. STATE HWY. COMM.

This road maintainer patrols twelve miles of highway daily



Street repair in a western city

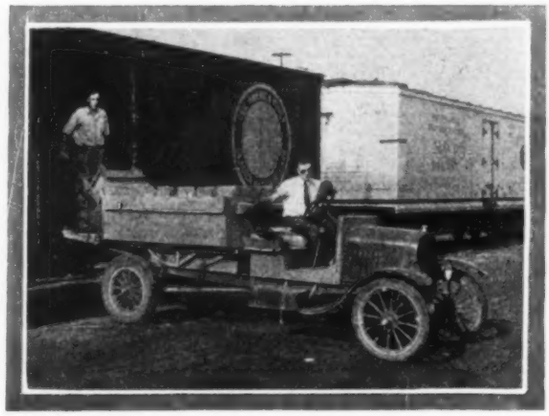
A Colorado maintenance outfit consisting of tractor and grader. It covers 18 miles of gravel road through the mountains once a week

No Rest for These Paving Bricks

Hustled From Freight Cars to Street in Special Racks

HAND to mouth buying is invading the street paving field, as evidenced by the methods used recently by Arthur E. Rutledge, contractor, in paving South Main Street, the principal thoroughfare of Rockford, Illinois.

Because South Main Street was in the midst of the city's principal business district, Mr. Rutledge hit upon a scheme which obviated the necessity of piling the brick on the sidewalks on either side of the street, by ordering the brick as he needed them and conveying them directly from the cars to the brick droppers.



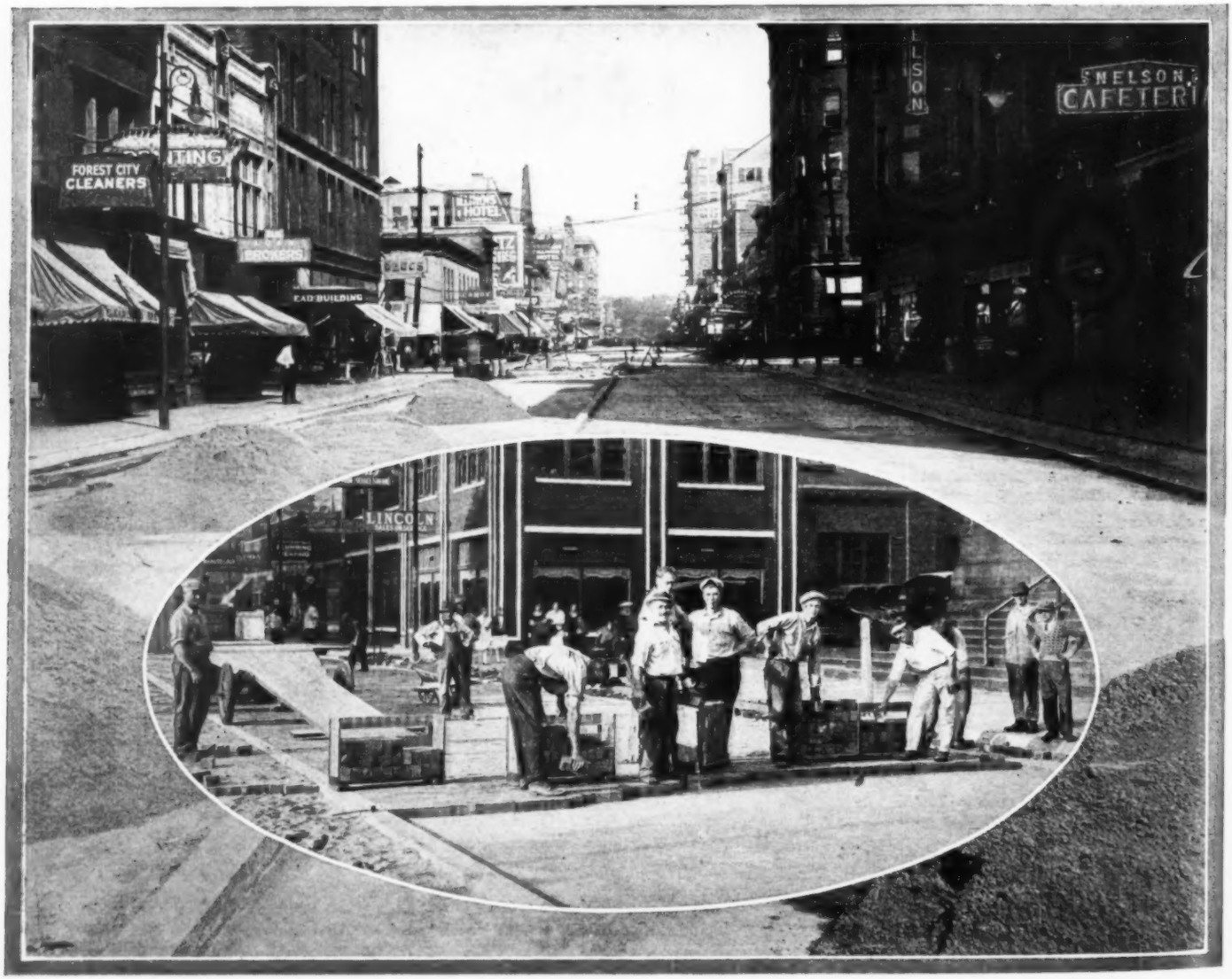
Taking bricks out of box car

Not only did this keep the sidewalks free, but it resulted in a saving amounting, according to Mr. Rutledge, to about 10 cents a square yard. In the neighborhood of five fewer laborers were required in handling the brick than are necessary where the brick are stacked alongside of the road and carried to the droppers by hand.

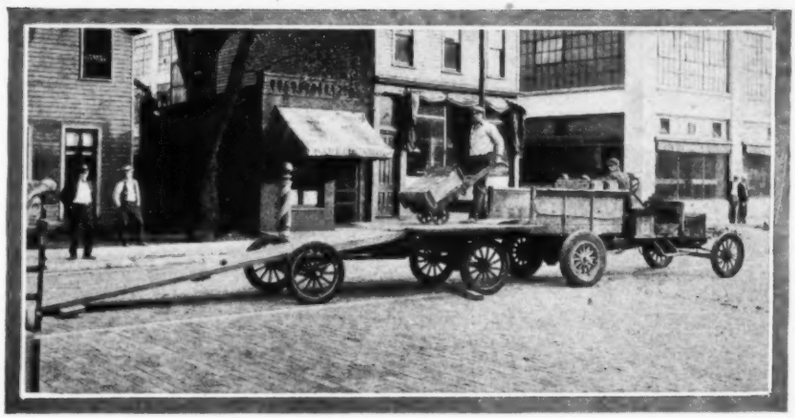
In order to accomplish this, Mr. Rutledge constructed some special wooden frames, large enough to hold fifty brick. The brick were racked in these wooden frames at the cars, loaded on trucks, hauled to the job, unloaded from the trucks and placed conveniently for the brick droppers.

Careful inspection on specifications drawn by B. C. Harvey, City Engineer of Rockford, was one of the features in connection with the construction of this pavement. The design called for a 7-in., 1:3:5 concrete base, 3-in. brick and sand cushion. The specifications called

Concrete base ready for sand cushion and brick. The inserted photograph shows the bricklayers at work, with truck which brought brick in left background



for a base with the smooth finish and perfect alignment of a finished pavement. This permitted a uniform depth of sand cushion, and resulted in a finished brick surface of unusual smoothness and alignment.



Wheeling brick in hand truck down inclined plane to street

At several of the more important intersections, a fairly dry 1:2:3 mix was used. The one-inch slump test was specified. This mix showed a strength of 1,534 lb. at 45 hr., thus permitting the contractor to proceed with the work and open the intersections at an earlier date than otherwise possible.

The project was 3,780 ft. in length with an overall width of 50 ft., the width of the brick surface alone being 43½ ft. Down the center of the pavement was constructed a curb 6 in. wide and of a height equal to the thickness of the brick surface and the sand cushion. This was of a 1:2:3 mix. It served the purpose of a guide for the template in spreading the sand cushion and also as a traffic marker in the finished pavement.

Asphalt filler, heated to a temperature of 390 degrees, was specified. The concrete center curb was painted with whitewash to prevent the asphalt filler from sticking to the curb.

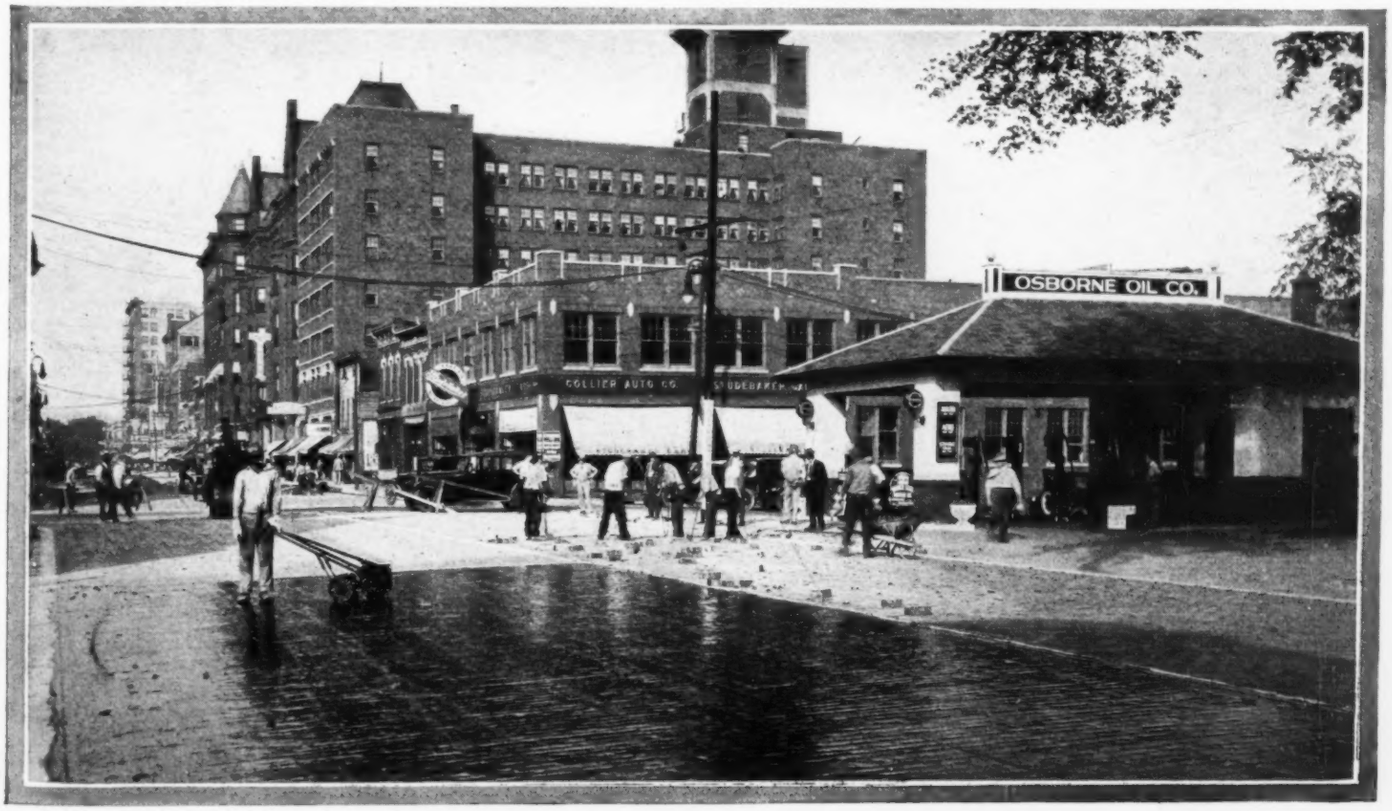
The method used in giving the concrete base a smooth finish and perfect alignment is of interest. After being struck off with a template, it was floated and then rolled with a light roller.

A comparatively new method was used in the application of the asphalt filler. A squeegee box, holding perhaps 8 or 9 gal. of asphalt, was used. This was equipped with a valve which is located in the bottom of the box immediately in advance of a semi-circular heavy rubber squeegee. By means of a lever which operates the valve, the flow of asphalt from the box can be carefully regulated by the man in charge of the apparatus. The box is drawn backwards rather than pushed forward over the brick surface. It is shown at the bottom of this page.

One of the advantages of this filler box over the hand squeegee method is a saving in asphalt filler, due to the fact that less asphalt remains on the surface of the brick. The use of this apparatus also results in a much neater job.

Handling brick in the manner described in this article requires an extremely efficient organization. The success which Mr. Rutledge obtained on this job proves that he has a contracting organization that is thoroughly dependable. Otherwise, it would never have kept things moving so smoothly. The elimination of storage piles along the sidewalks or anywhere else probably effected an even greater saving than is at first realized. In addition, there is not the slightest doubt of the fact that the merchants of Rockford appreciated Mr. Rutledge's method of handling the paving job. In too many cases a paving contractor makes enemies all along the route of his work. His intentions may be of the best, but he usually has to pile his materials somewhere and they generally make trouble for the man in front of whose premises they are piled. This situation did not exist on this job.

Applying asphalt with special squeegee box which is drawn backward over pavement



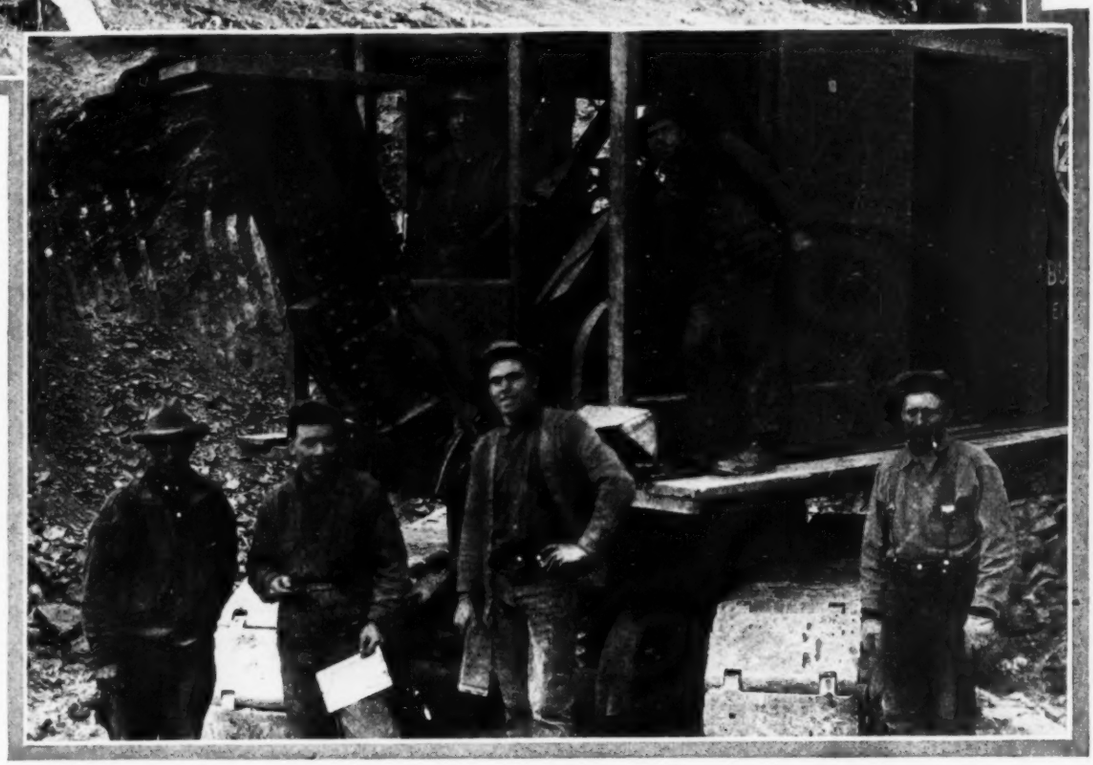
Far From the Base of Supplies

Diesel Operated Shovel Will Work Through Idaho Winter

A SHOVEL equipped with a Diesel engine is proving the economical machine on an Idaho road grading job which is 55 miles from the railroad. All fuel and supplies must be trucked over this distance. The job itself is 9 miles in length and consists of 100,000 cu.yd. of excavation and one 70-ft. span concrete bridge. It is on the North and South Highway, one of Idaho's three main arteries, south of Riggins. On the map of an ordinary atlas, it might be located along the Salmon River, more than half of the distance north from Boise to Lewiston.

The material is estimated to be 60 per

The upper photograph shows the old road before grading began for the new. Below is a section of the new highway



The shovel in operation is shown above. Lloyd Terteling is the man at the left in the lower picture, holding a conference with his men

cent rock. Eight fresnos are operating on the light, scratchy ground. Two 5-ton trucks are hauling from the shovel whatever material is not cast. A large part of the work is casting. By double shifting the shovel and trucks (two 10-hour shifts) one-third of the total amount of excavation was removed in the first 23 days on the job. The shovel has a ¾-yd. dipper.

The mountains rise on both sides of the canyon so abruptly that there is no way to detour around the job. The contractor, therefore, has been allowed to close the road for the winter. The elevation is only about 1,500 ft., and there will be neither snow nor cold in the canyon sufficient to cause cessation of the work. The winter season, in fact, is the practical one for performing work along this section of the North and South Highway. In summer, the intense heat and lack of breeze make labor in the canyon disagreeable, and it is almost impossible to keep workmen on the job.

The work is being managed by Lloyd Terteling of J. A. Terteling and Sons, the contractors, whose headquarters are at Moscow, Idaho. Perry Oxley, district engineer of the Bureau of Highways, is exercising general supervision.

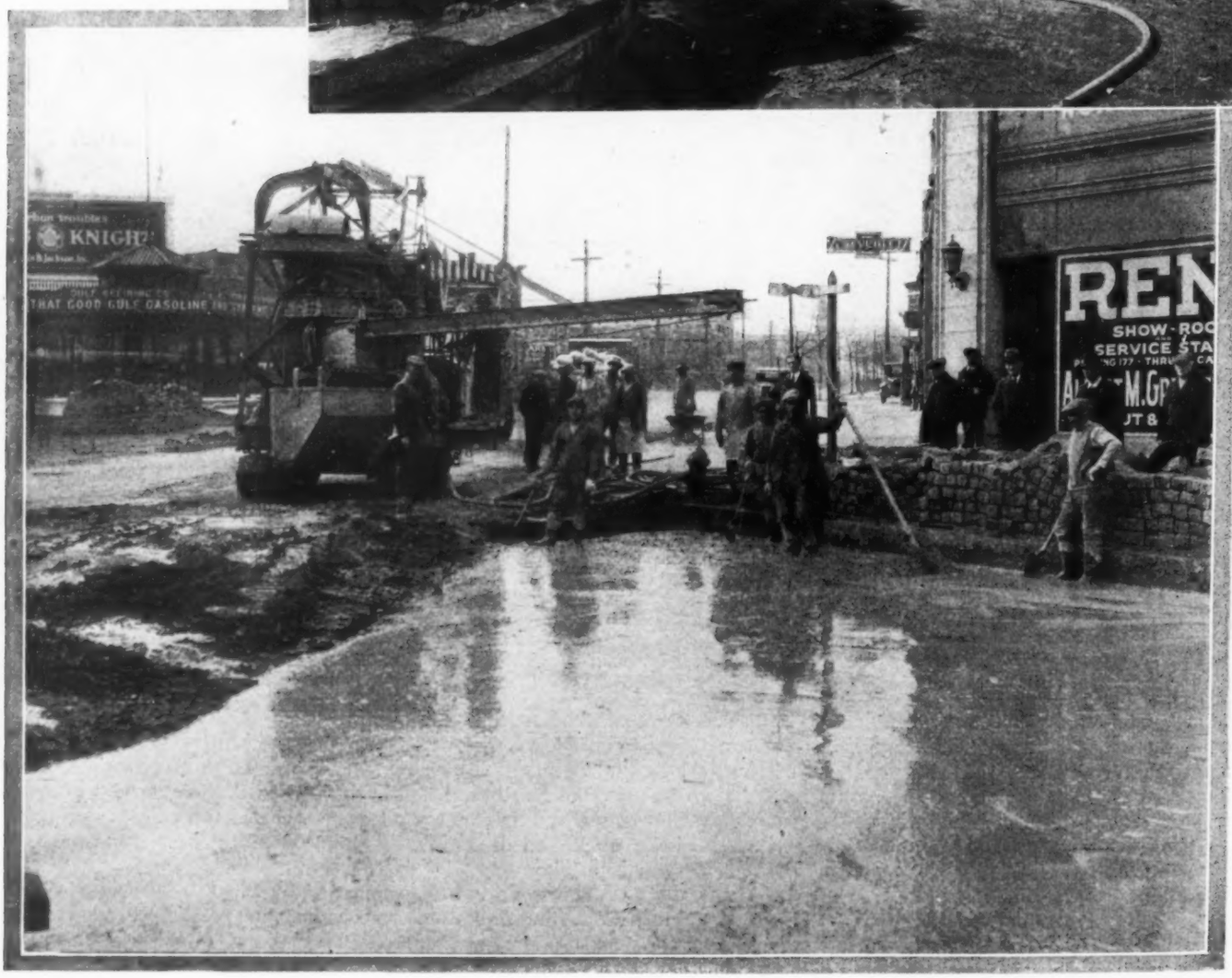
Speed From Philadelphia

SOME remarkable work in laying a concrete base for a granite block pavement has been done recently by Francis A. Canuso & Sons of Philadelphia, who have been repaving Broad Street over the newly constructed subway.

The three Canuso contracts comprise about 4 miles of roadway 92 ft. in width, consisting of an 8-in. concrete base without reinforcements on which granite blocks were laid.

The two photographs on this page show a Ransome 27-E mixer pouring the concrete base for half of the roadway, 46 ft. wide, which was made with one operation of the mixer working directly on the subgrade. Aggregates were delivered in compartment trucks from a batcher plant two miles away. With this set-up the Canuso organization has been making remarkable progress. The best day's run was 540 cu.yd., a splendid record for this sort of work.

The big paver on the job



A sea of freshly laid concrete. Water for the paver was taken from fire hydrant

Old Stuff

The photographs on this page go back to the earliest days of road building in the United States. The three photographs at the top are relics of the Old Cumberland Road. They show one of the old toll houses, a sign board bearing the rates of toll and a bridge over the Monocacy River built in 1810 with funds subscribed by the bankers of Baltimore.

The large photograph at the bottom of the page was taken in Alexandria, Virginia, and shows a cobblestone pavement that was laid during Revolutionary times by Hessian prisoners. All of the photographs on this page and a number of others on various pages of this issue of *Successful Construction Methods* are from the U. S. Bureau of Public Roads.

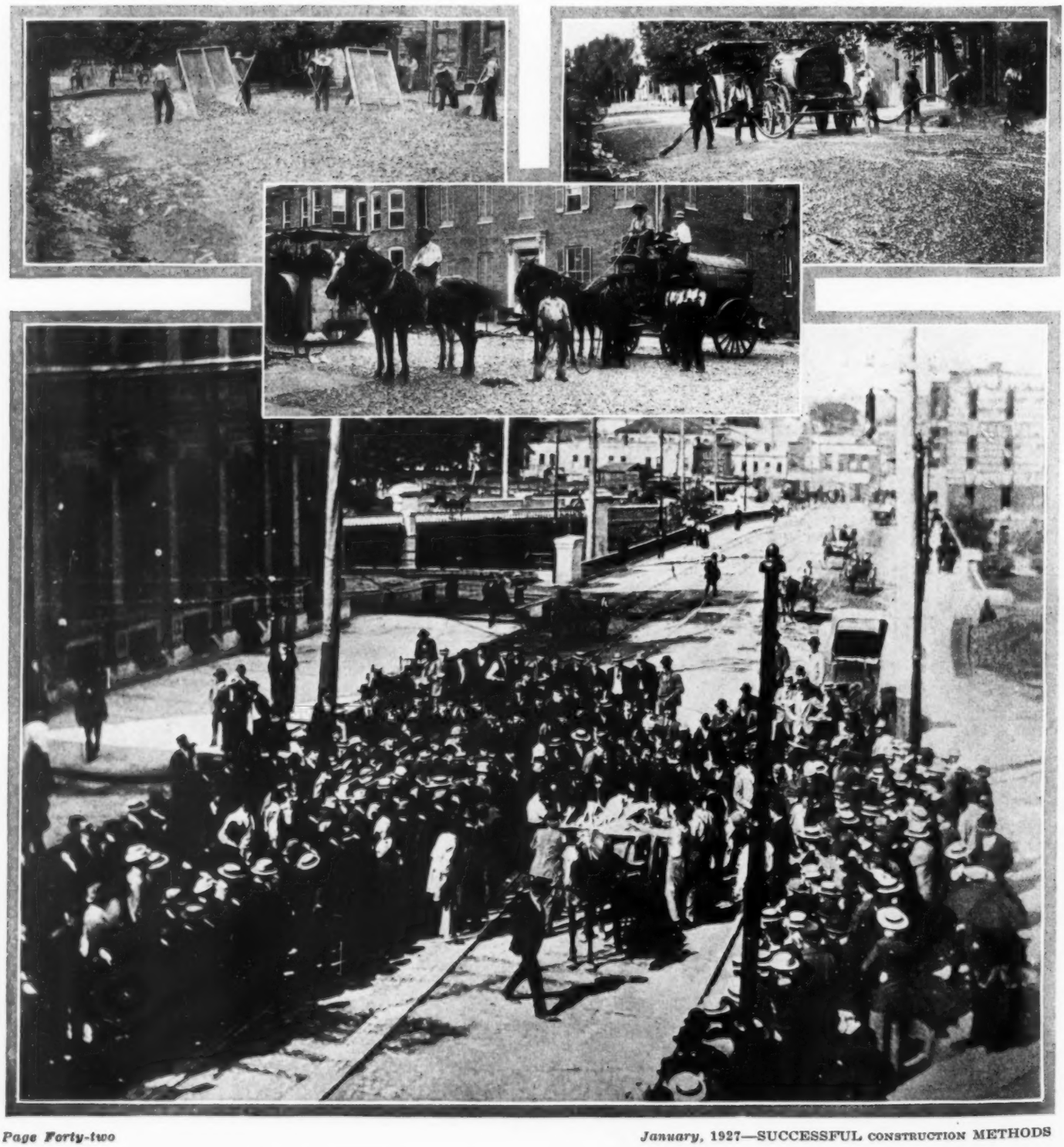
Rates of Toll
on the Cumberland Road in
Pennsylvania.
Every score of sheep 6′
" " Hogs 6′
" " Cattle 12′
" Horse and rider 4′
Every led or drove horse, Mule or Ass 3′
" Sled or sleigh drawn by one horse or pair of oxen 3′
" Horse or pair of oxen in addition 3′
" Dearborn, Sulky, Chair or Chaise with one horse 6′
" Horse in addition 3′
Every Chariot, Coach, Coucher, Stage,
" Phaeton or Chaise with two horses and four wheels 12′
" Horse in addition 3′
Every other carriage of pleasure by whatever name it may be called, the same according to the number of wheels and horses drawing the same
Every cart or wagon, whose wheels do not exceed three inches in breadth, drawn by one horse or pair of oxen 4′
" Horse in addition 3′
Every cart or wagon whose wheels exceed three inches and does not exceed four inches in breadth, for every horse or pair of oxen drawing the same 4′
Every cart or wagon whose wheels exceed four inches, and do not exceed six inches in breadth, for every horse or pair of oxen drawing the same 3′
Every cart or wagon whose wheels exceed six inches and do not exceed eight inches in breadth, for every horse drawing the same 2′
All carts or wagons whose wheels exceed eight inches in breadth FREE
Any person refusing or neglecting to pay toll a fine of

Old

The pictures on these two pages were taken during the early days of the present road-building era. An examination of them will show how far the science of road building has progressed in the last ten or fifteen years. In these photographs men are in the majority and machines in the minority. Probably one of the greatest advances made in highway construction is in devising machines to replace hand labor. The photograph at the left gives an interesting bit of road-building history, as it shows girls working on a bituminous pavement during the great war.

The three small photographs show the construction of a bituminous macadam road in Westminster, Md., in 1910. The methods used seem crude compared to those employed today. An old-fashioned sprinkling cart with a special hose attachment did its best to play the part of a tar distributor.

The large photograph at the bottom of the page shows the laying of the first asphalt pavement in Ottawa, Canada, in 1895. The event seems to have been made the occasion of a formal celebration. This photograph was printed through the courtesy of the *Canadian Engineer* and Frank Hogan of Imperial Oil, Ltd., Toronto.

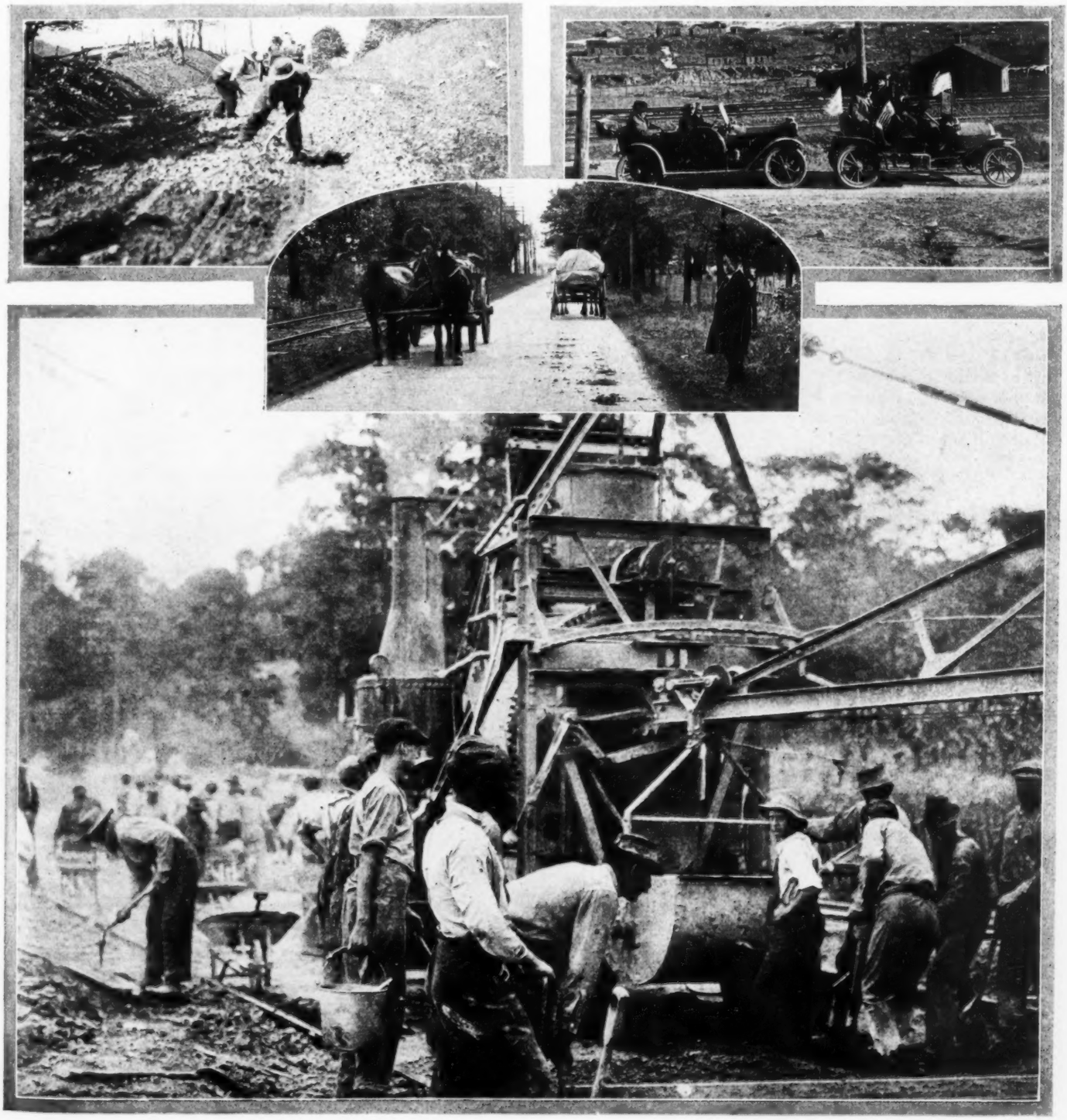


Stuff

Hand labor is again the rule in the construction photographs on this page, particularly in the large picture at the bottom which looks like a mass meeting. It was taken in 1914 and shows one of the early concrete paving jobs in Ohio. Materials were piled on the road and brought to the skip in wheelbarrows, a procedure which required a big payroll.

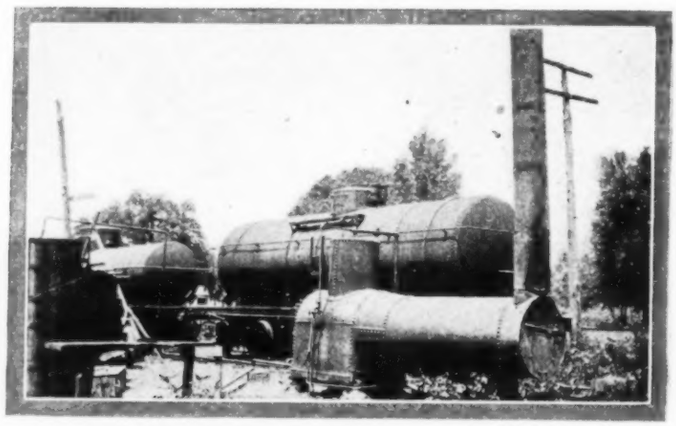
Two of the photographs in the upper portion of the page show construction work on Connecticut roads about 1911. In both of these pictures the main reliance is placed on hand labor. These two photographs are the property of James H. MacDonald former state highway commissioner of Connecticut and one of the founders of the American Road Builders' Association.

The picture of the gaily decked automobile was taken on the Sante Fe trail at Raton Pass, Colorado. It shows one of the early pathfinding expeditions. The center picture comes from Wayne County, Michigan, and shows one of the early concrete roads built by that county which was a pioneer in that form of construction. This photograph was sent to *Successful Construction Methods* by E. N. Hines, Chairman of the Wayne County Road Commission.



Feeder Trucks Haul Tar

Form Link With Distant Heating Plant on Penetration Job in West Virginia



Heating plant at Spencer which used natural gas

WEST VIRGINIA'S comprehensive roadbuilding program includes surfacing of various types. During the construction season just ended, C. V. Rector of Muncie, Indiana, has been finishing a stretch of highway 11.4 miles long in West Virginia between Spencer and Clendenin. This is a section of the main road between Parkersburg and Charleston.

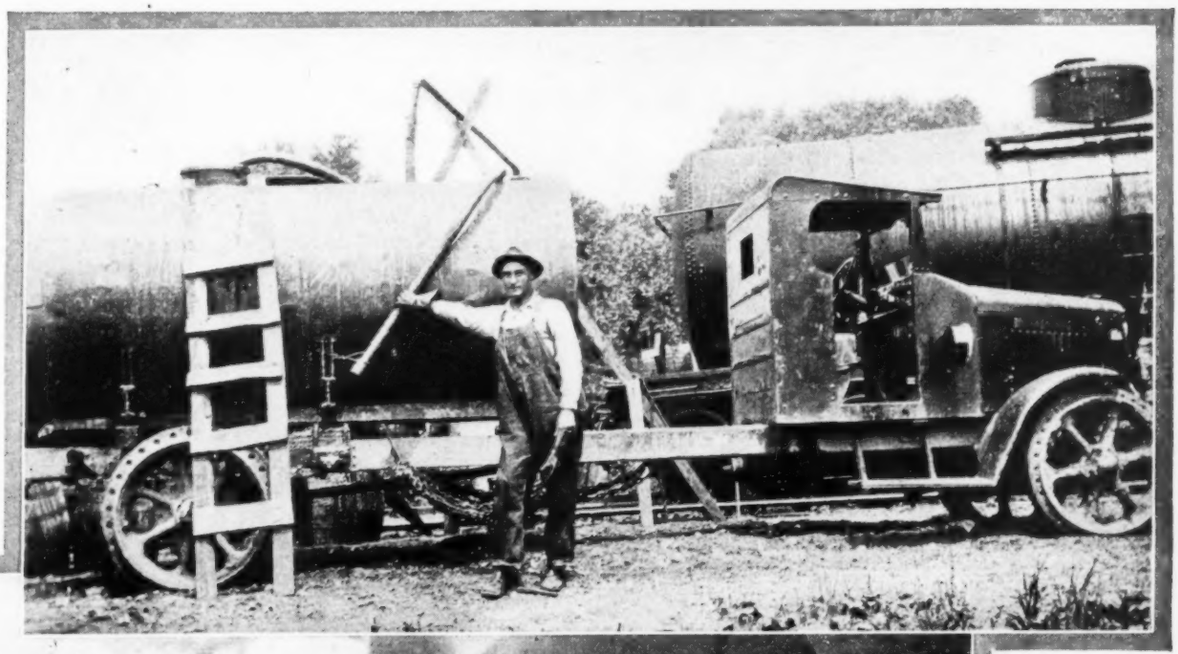
The contract called for a penetration job, a Telford base course of 8 in. of sandstone being used with a 3-in. limestone top. The photographs which accompany this article show how the tar for the penetration work was handled. Two heating plants were established, one at Spencer and the other at Clendenin. The Spencer plant, which is shown in the small photograph at the top of the page, used natural gas for heating the tar, which was brought to the heating plant in tank cars. As the Spencer plant was 9 miles from the job and the Clendenin plant required a dead haul of 8 miles, the contractor handled the work with three feeder trucks. These were 3½-ton International trucks carrying 800-gal. tanks. These three trucks formed the link between the heating plants and the distributor which never left the road. The photographs on the opposite page show three steps in the process of getting the tar on the road. In the upper photograph one of the tank trucks is being filled at the heating plant. The center photograph shows the distributor being loaded from the feeder truck, and the lower photograph shows the Etnyre distributor, which was mounted on a Mack truck, in action. Most of the road was 16 ft. in width, but at curves and other points it was widened, at some places reaching a width of 26 ft.

The photographs which illustrate this article were sent to *Successful Construction Methods* by Charles J. Shelly who was employed on the job as superintendent of the tar application for the F. J. Lewis Manufacturing Co. of Chicago.

Like so many modern roadbuilding jobs, the grading for this section of highway was awarded last year. Work began in August, 1925, and a great deal was accomplished before winter set in. This gave the fills a chance to settle. Grading one year and paving the next is becoming a popular custom.

A typical section of the road shortly after it was surfaced and before the shoulders were completed

to Distributor on Road



Loading one of the three feeder trucks at heating plant

The distributor at the right is being loaded from the feeder truck at the left

Distributor applying tar to 3-in. course of limestone

Compact Set-Up at Material Yards

Freight Cars, Stock Piles and Bins All Within Range of 30-Foot Boom

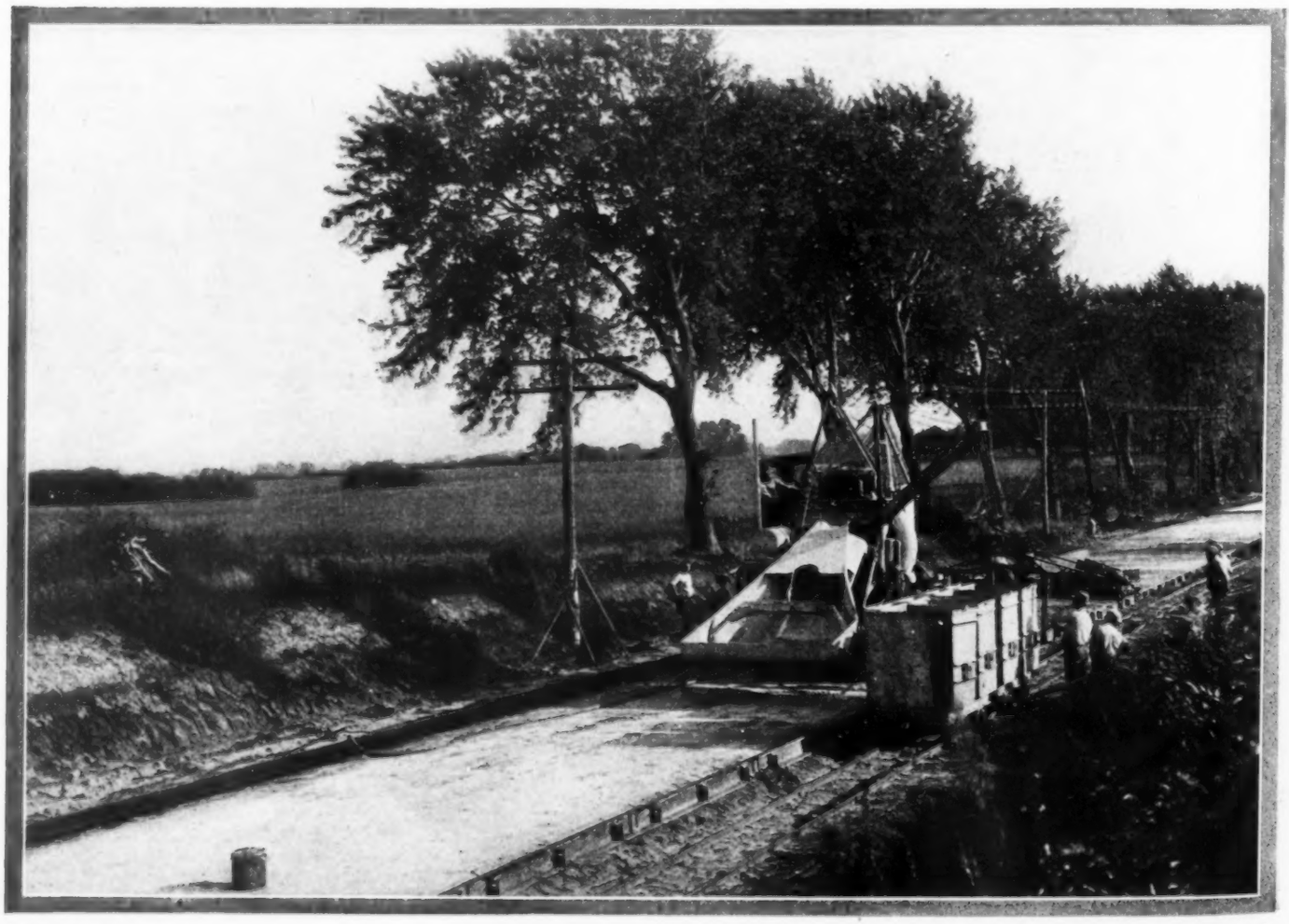
Picking up the cement

The first material yard

The flipper signal

ON A CONCRETE paving job handled with industrial railway, the speed in loading trains at the material plant is an important factor in determining the speed with which the mixer can work, especially where long hauls are necessary. So the S. & H. Construction Co. of Milwaukee, contractors on 10.7 miles of highway between Rockford and Rockton, Illinois, reasoned, and they accordingly planned their material plants to expedite loading.

Paver and finisher on the job



rds Speeds Paving Job

The job was divided into sections of 7 and 3.7 miles. The first plant was erected midway of the 7-mile section. As the photograph shows, Blaw-Knox aggregate bins over the track dumped the materials into the batch boxes on the cars. The whole plant was arranged so compactly that freight cars, stock piles, and bins were all reached with a 30-ft. boom.

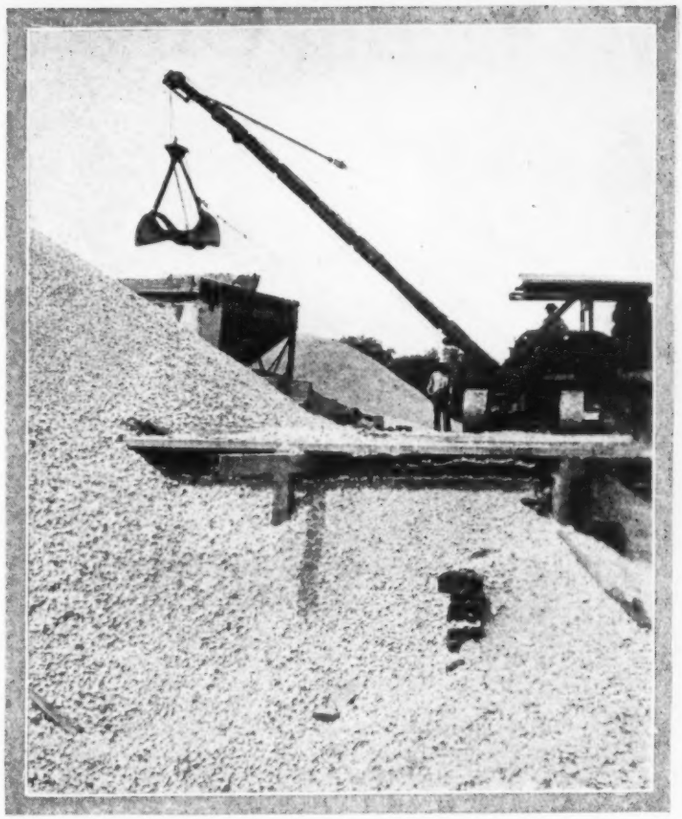
A flipper, or L-shaped board, fastened to a beam below the hoppers, was of great assistance in rapid spotting of the cars. One of the photographs illustrates the use of this simple contrivance. As the edge of the box struck the hanging side of the L, it flipped the other side into view, and the operator stopped his train.

From the aggregate bins the cars passed alongside the cement platform. Ten-car trains of 20 batches hauled by Whitcomb locomotives were loaded at this efficient plant in 5 minutes. Four men took care of the aggregates, 2 in the car, 1 on the crane, and 1 at the bins.

On the second part of the job, the plant was located about ½ mile from one end of the 3.7-mile stretch. It was similar to the first in design, but a bend in the track made it impossible to use the flipper signal in spotting.

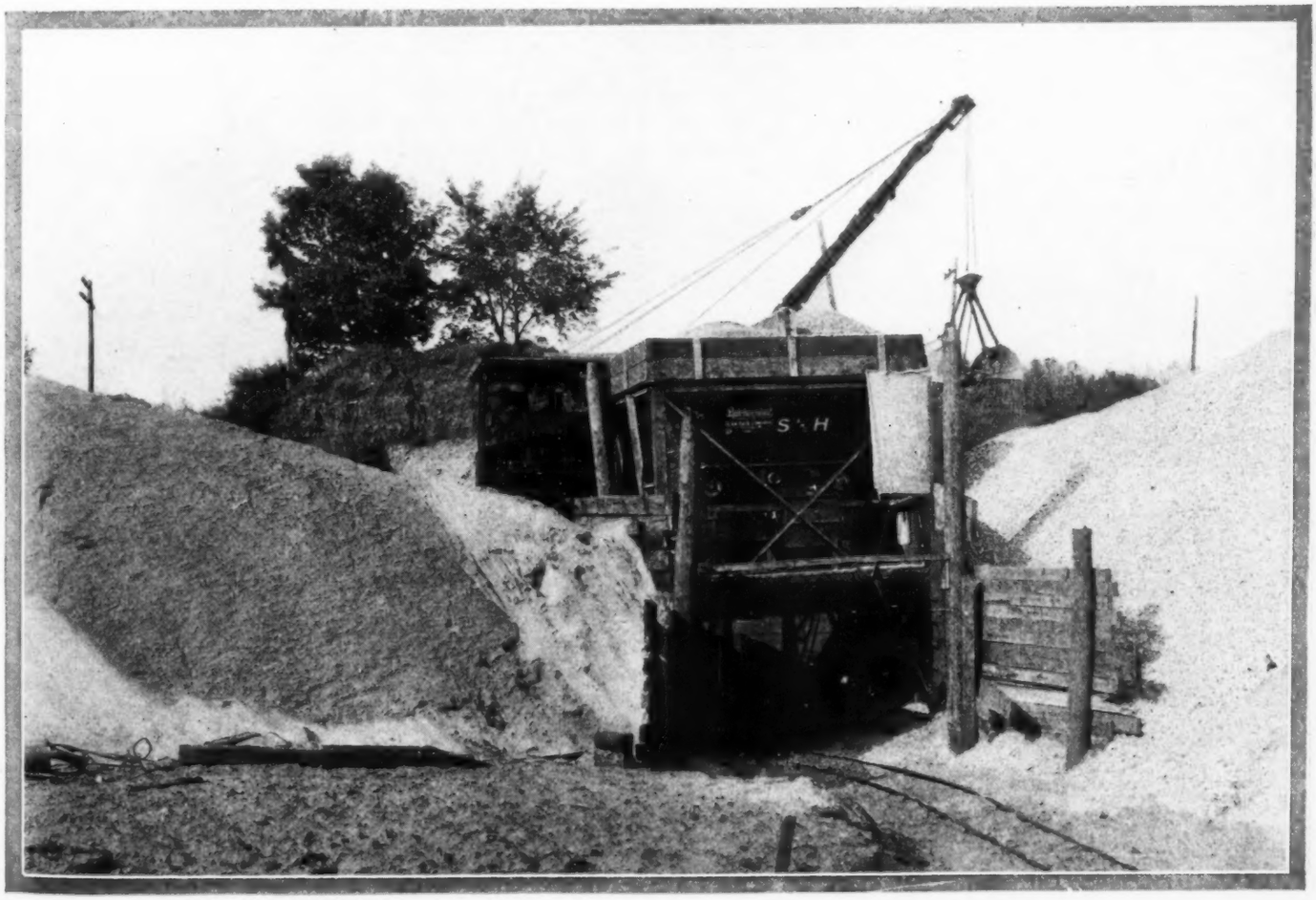
The paver used on this job was a Multi-Foote 21-E. A Lakewood finisher also was used. Fordson tractors and a Hug subgrader prepared the way for the mixer. The grading on this job was done last year. The road conforms to the usual Illinois specifications. It is 18 ft. in width with a 9:6:9-in. cross-section.

With the aid of these two plants, G. J. Walsh, secretary of the S. & H. Construction Co. and superintendent on the job, has managed to keep his paver working to capacity.

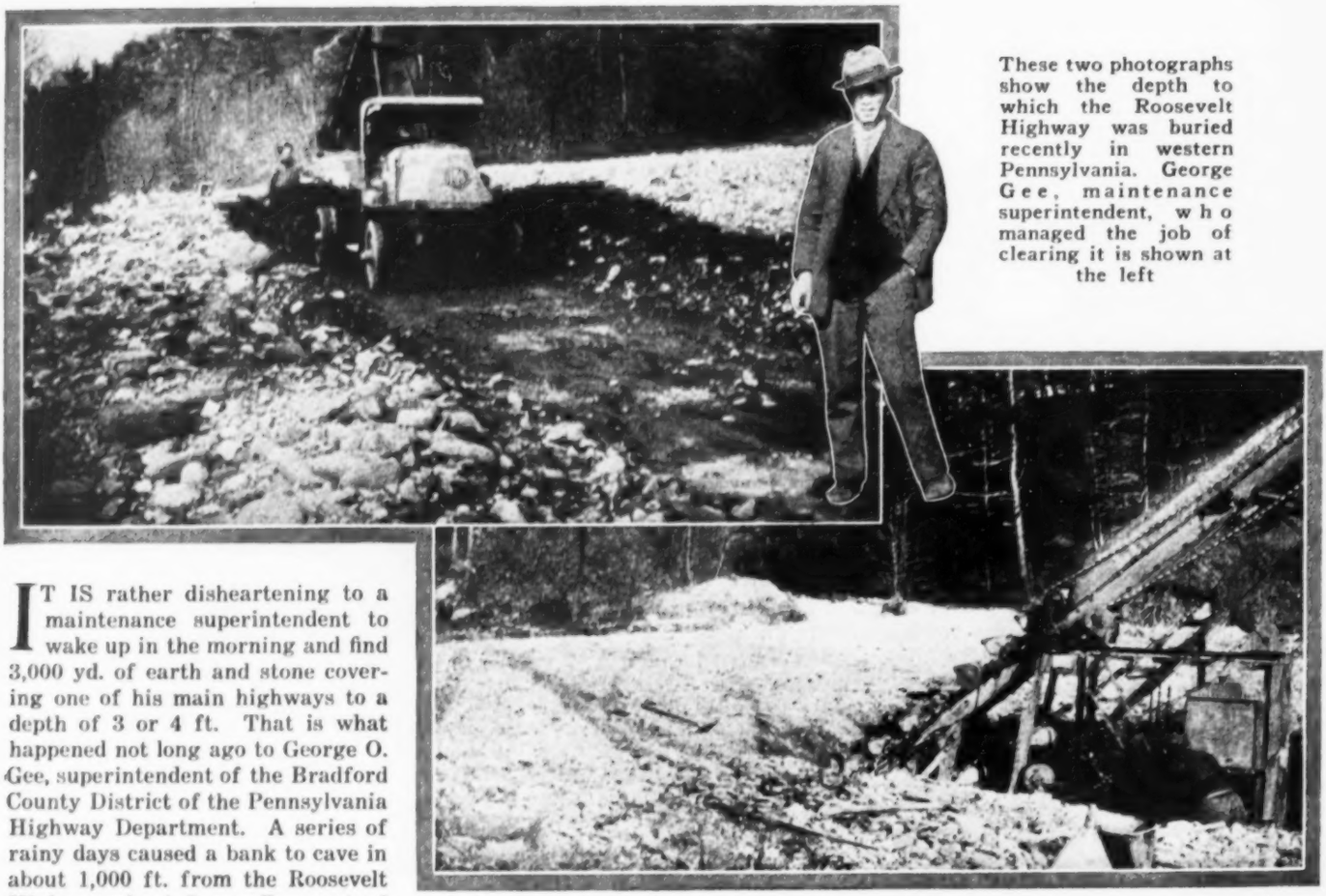


Above — Filling measuring bins with crane from big and conveniently arranged stock piles

Below—A close-up of the second material yard. Arrangement identical with that of first yard



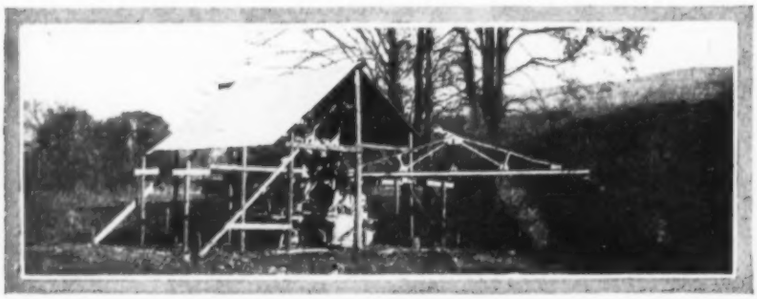
Digging Up a Buried Highway

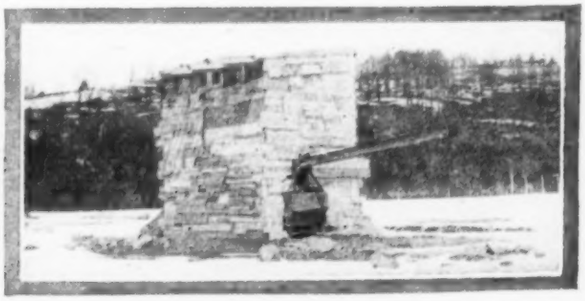


These two photographs show the depth to which the Roosevelt Highway was buried recently in western Pennsylvania. George Gee, maintenance superintendent, who managed the job of clearing it is shown at the left

IT IS rather disheartening to a maintenance superintendent to wake up in the morning and find 3,000 yd. of earth and stone covering one of his main highways to a depth of 3 or 4 ft. That is what happened not long ago to George O. Gee, superintendent of the Bradford County District of the Pennsylvania Highway Department. A series of rainy days caused a bank to cave in about 1,000 ft. from the Roosevelt Highway about four miles west of Towanda with the result shown in the accompanying photographs. The road foreman was on the job immediately and as a result of his activity in obtaining a tractor to pull cars over the gravel wash, traffic was held up for only two hours. In the meantime, Mr. Gee requisitioned a Link-Belt crawler loader and set it to work clearing the road. The loader backed into the gravel and with the aid of a Mack truck dug out the road.

Protection for Pavers





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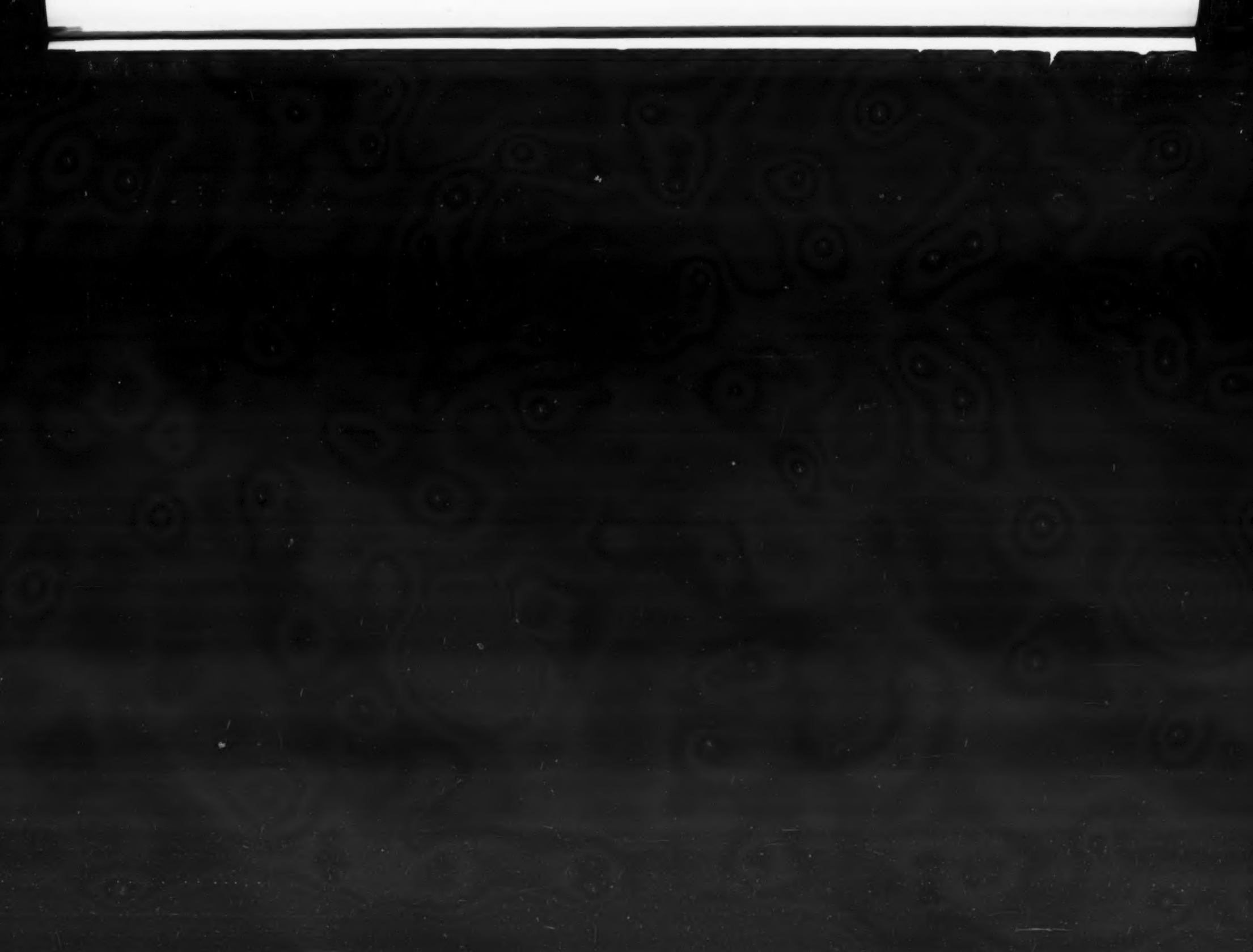


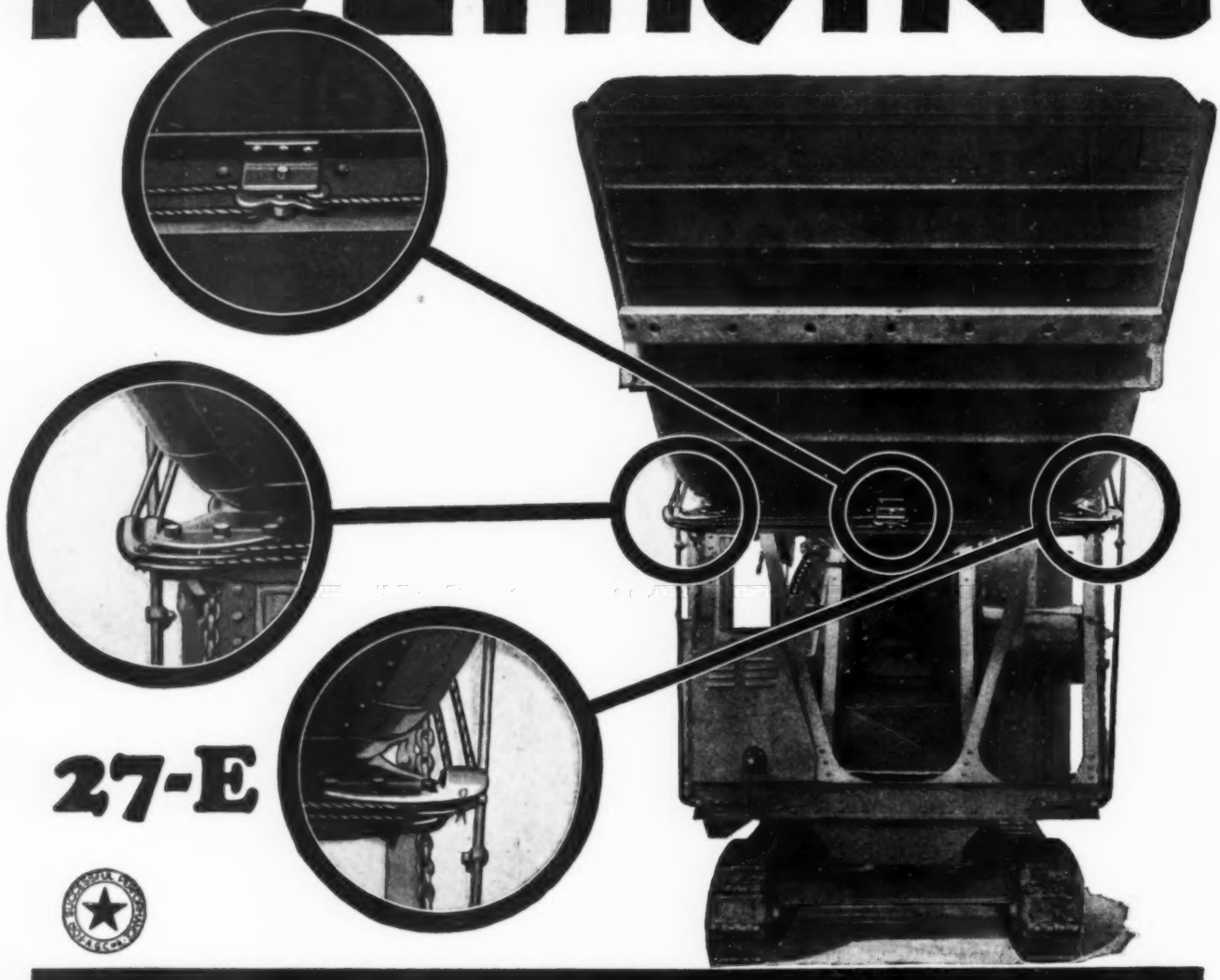
The LORAIN 75

On the Center Drive Truck

Came thru the past year with every promise more than fulfilled,~ an army of enthusiastic users,~ a new pace set for 1927 shovel and crane performance.

See them at the Road Show

KOEHRING



27-E

Double Skip Cables!

THE end of fast cable wear, frequent breakage, delay, and replacement!

Each cable is continuous from one side of mixer to the other side, each passing through the automatic equalizing device at center of the skip.

No matter which side of skip gets the big load, the lifting strain is distributed equally over each cable, and over both end sections of each cable on each side of the mixer!

Either cable alone is capable of operating skip. Double, self-equalizing cables give extra protection against breakage and accident and makes an amazing saving in cable wear, trouble, and replacement.

SIZES

Pavers—7-E, 13-E, 27-E. Auxiliary equipment and choice of power to suit individual needs. Complies with A. G. C. Standards.

Construction Mixers—10-S, 14-S, 21-S, 28-S. Steam, gasoline or electric power. Mounted on trucks or skids. Rubber tired wheels optional. 28-S on skids only. Complies with A. G. C. Standards.

7-S Dandie Mixer—Two or four cylinder gasoline engine. Power charging skip, or low charging hopper and platform. Rubber tired steel disc wheels or steel rimmed wheels. Complies with A.G.C. Standards.

Write for Paver Catalog No. P. 17

KOEHRING COMPANY

PAVERS, MIXERS—GASOLINE SHOVELS, CRANES AND DRAGLINES

MILWAUKEE, WISCONSIN

Sales Offices and Service Warehouses in all principal cities

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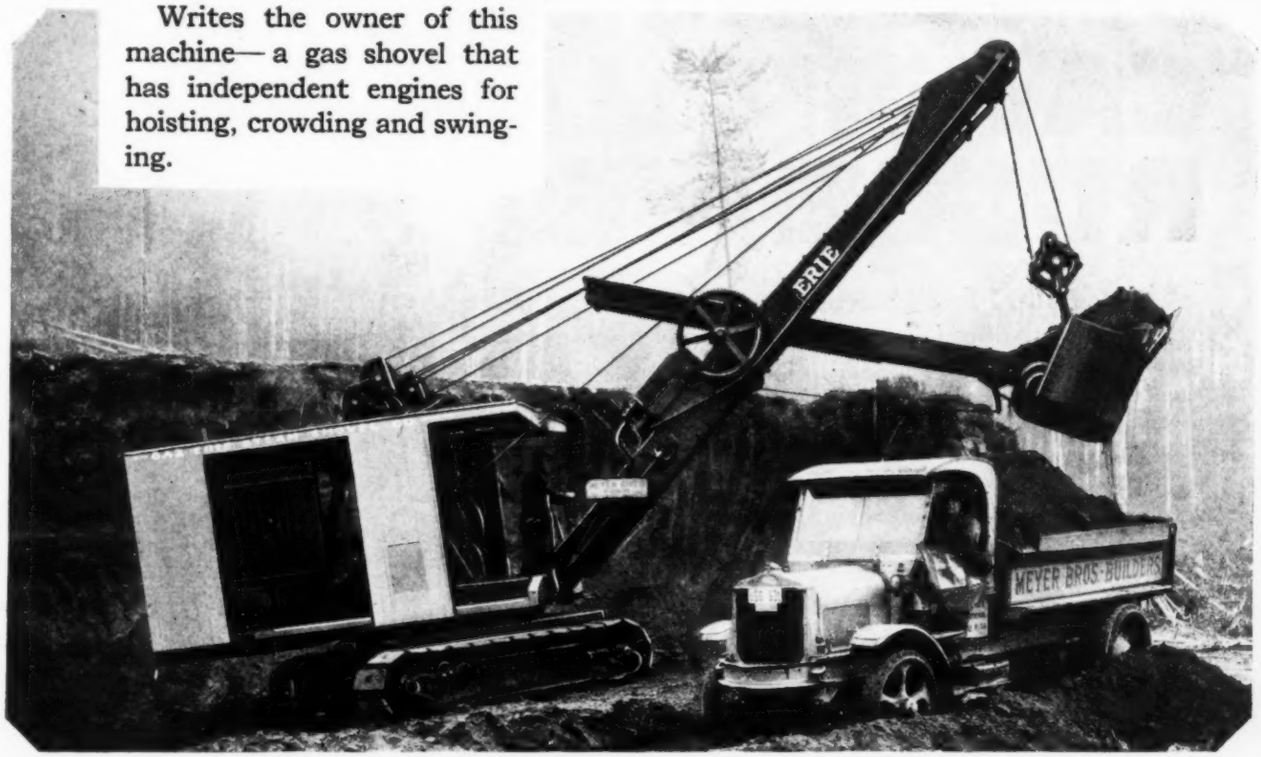
KOEHRING HEAVY DUTY

A 3173-I

"Gas+Air ERIE outdug them all"—

Writes the owner of this machine—a gas shovel that has independent engines for hoisting, crowding and swinging.



You can see these remarkable gasoline shovels, that have direct-connected air engines for crowding and swinging, in all parts of the country—

And owners everywhere are sending in reports like this one from Meyer Bros., whose shovel is shown above:

"It is very hard to find words to express our appreciation of our Gas+Air ERIE. Digging tough shale in one cut where three other shovels had been working—one a gasoline shovel of another make—the Gas+Air ERIE outdug them all. For yardage and for handling the hard material with greater ease, there was no comparison between the other gas shovel and the Gas+Air ERIE. Refer anyone to us who is contemplating purchasing a shovel."—*Theodore G. Meyer, President, Meyer Bros., San Francisco, Calif.*

For that job where a gas shovel is needed—

It is not necessary to buy a gas shovel that will put you at a disadvantage later, on work where it comes into competition with steam machines.

You can buy a gas shovel that will hold its own in any company—one with all the speed and flexibility of a Steam ERIE.

Watch a Gas+Air ERIE at work; see how its direct-connected crowding and swinging engines *have set a new standard of output for gasoline shovels.*

ERIE STEAM SHOVEL CO., ERIE, PA., U. S. A.

Branch Offices: Boston, New York, Philadelphia, Pittsburgh, Atlanta, Chicago — Representatives throughout the U. S. A.

GAS+AIR and Steam ERIE DREADNAUGHT

SHOVELS, CRANES, DRAGLINES, TRENCH HOES, ETC.

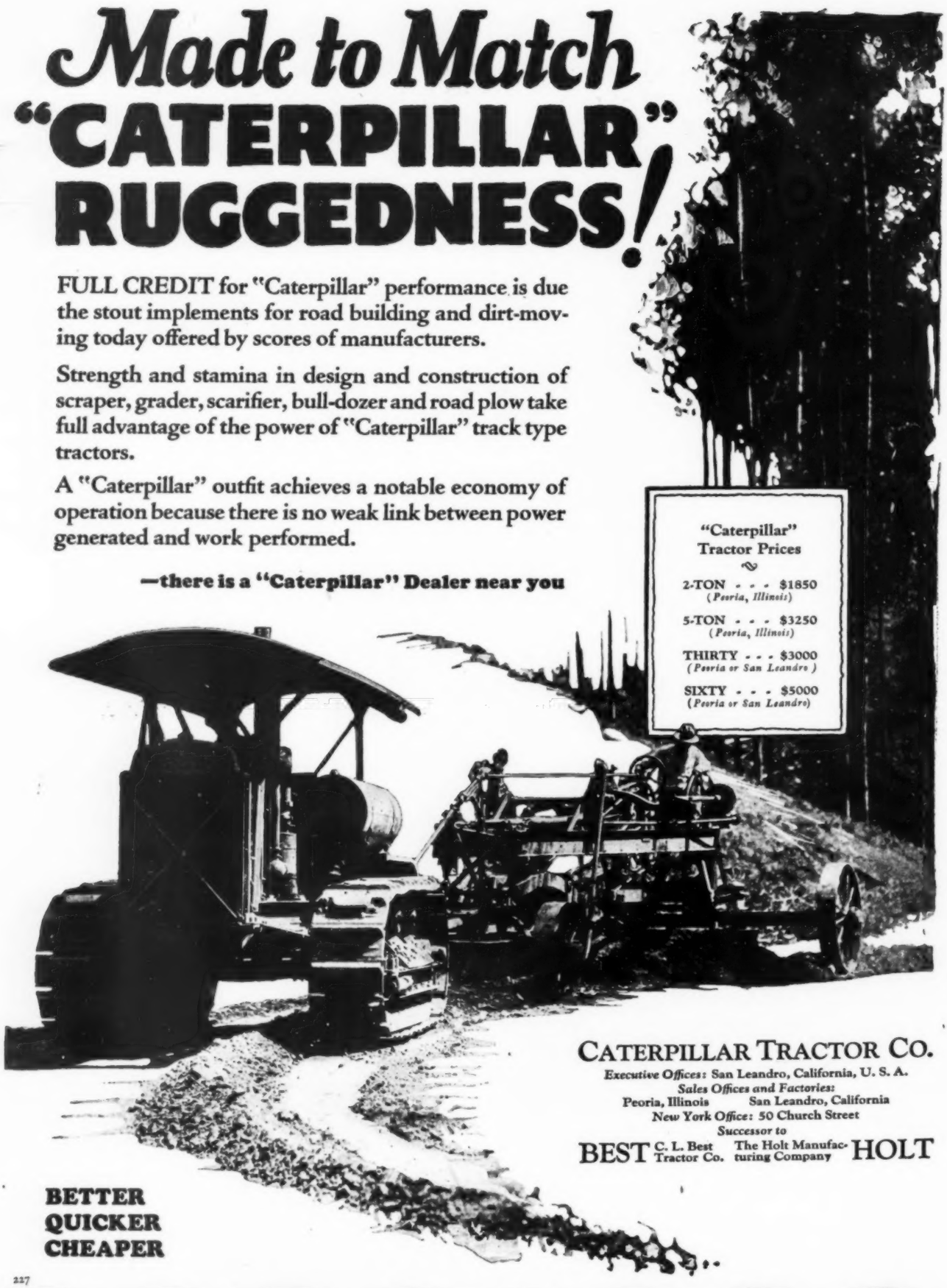
Made to Match "CATERPILLAR" RUGGEDNESS!

FULL CREDIT for "Caterpillar" performance is due the stout implements for road building and dirt-moving today offered by scores of manufacturers.

Strength and stamina in design and construction of scraper, grader, scarifier, bull-dozer and road plow take full advantage of the power of "Caterpillar" track type tractors.

A "Caterpillar" outfit achieves a notable economy of operation because there is no weak link between power generated and work performed.

—there is a "Caterpillar" Dealer near you



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2-TON - - - $1850 (*Peoria, Illinois*)

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227

CATERPILLAR

REG. U.S. PAT. OFF.

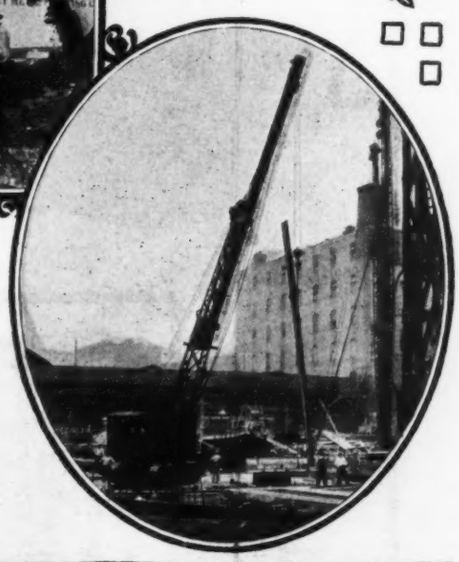
The NORTHWEST Exhaust

January, 1927

EXTRA!

NORTHWEST ANNOUNCES MODELS 2 AND 3

½ & ¾ CU. YARD CONVERTIBLE SHOVELS



Chicago, Ill.—(Special.)—The Northwest Engineering Company, 28 E. Jackson Blvd., today made startling announcements to the effect that two new Northwests would be placed on the market for the coming year. These machines will be known as Model 2 and Model 3.

The first is built as a ½ cu. yd. shovel and can be converted to a ½ cu. yd. crane or a dragline handling a ½ cu. yd. bucket on a 35-foot boom.

Model 3 is a ¾ cu. yd. and can be converted to a ¾ cu. yd. crane or a dragline handling a ¾ cu. yd. bucket on a 35-foot boom. Models 2 and 3 are built in answer to the insistent demand for small capacity machines embodying the high standard of construction and the many features that Northwest pioneered.

Have Money Making Features

These machines are the equals of the famous Models 104 and 105, except as to size and capacity. They have all the Northwest money making features: the "feather-touch" clutch control, positive steering, ball bearings, simplicity, etc.

Heavy Duty Power Plants

The power plants furnished with the new Northwests are of the heavy type, built for this class of work. Parts are of generous size and strength, lubrication is positive and the horsepower ratings are conservative.

Many industries have longed for a real small capacity machine with the sterling qualities demonstrated by the larger Northwests. By these concerns the Models 2 and 3 will be welcomed. They can render great value in the gravel or clay pit, the building supply yard, the small scrap iron yard, and as an all 'round aid to the big machines in the general contracting industry.

Electric Power

When electric power is desired electric motors of suitable horsepower can be furnished in place of the gasoline unit.

HAVE FEATURES NORTHWEST MADE FAMOUS

Chicago, Ill.—(Special.)—We are advised today by special wire that the new Northwest machines, Models 2 and 3, are to have all the money making features made famous by the Models 104 and 105, so well known in the field.

Steering will be accomplished by one man from his seat in the cab and with full power on both crawlers while turning as well as while going straight ahead. Either crawler is slowed down for turning, not blocked, allowing turning to right or left with a sure, steady movement, free from the jerk that comes with a blocked crawler or slipping clutches.

The "Feather-Touch" Control

Operation will be made easy by the "feather-touch" clutch control that utilizes the power of the engine for throwing the heavy clutches. This device permits the feel of the bucket through the lever, a feature not present with a steam or air ram.

Ball Bearings

As with the Models 104 and 105 all high speed shafts are mounted on self-aligning ball bearings. This reduces friction losses and eliminates much of the constant attention to lubrication.

Drive Gears in Oil

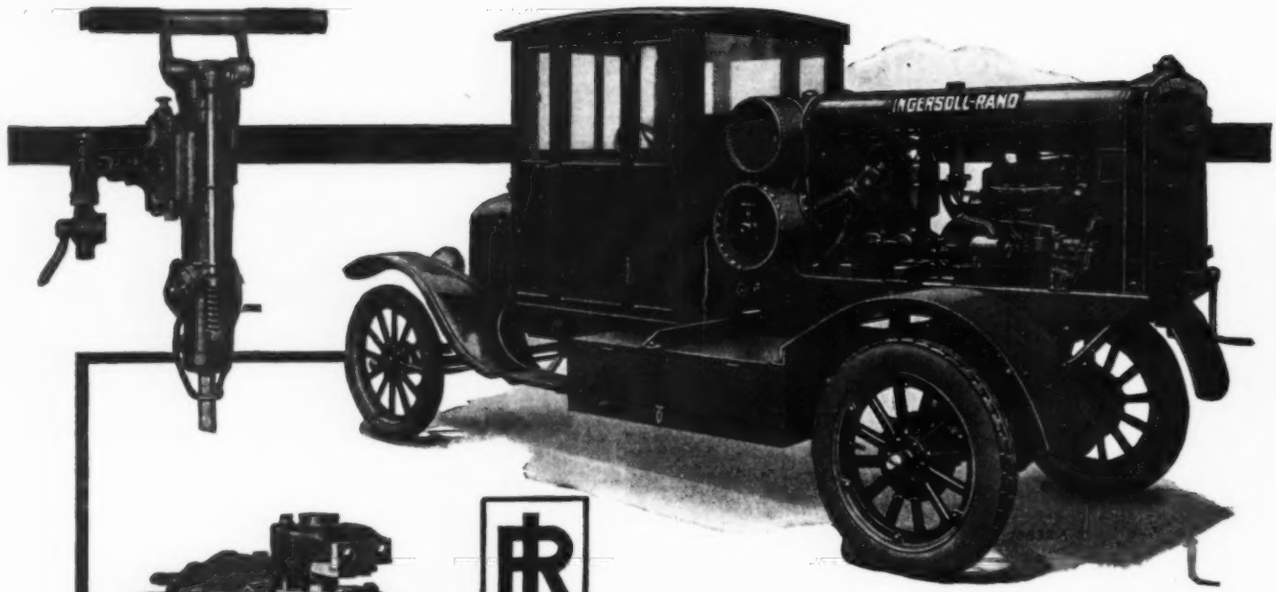
The drive from the engine is taken through helical cut steel gears mounted on ball bearings and running in an oil bath. This is silent, positive and enduring.

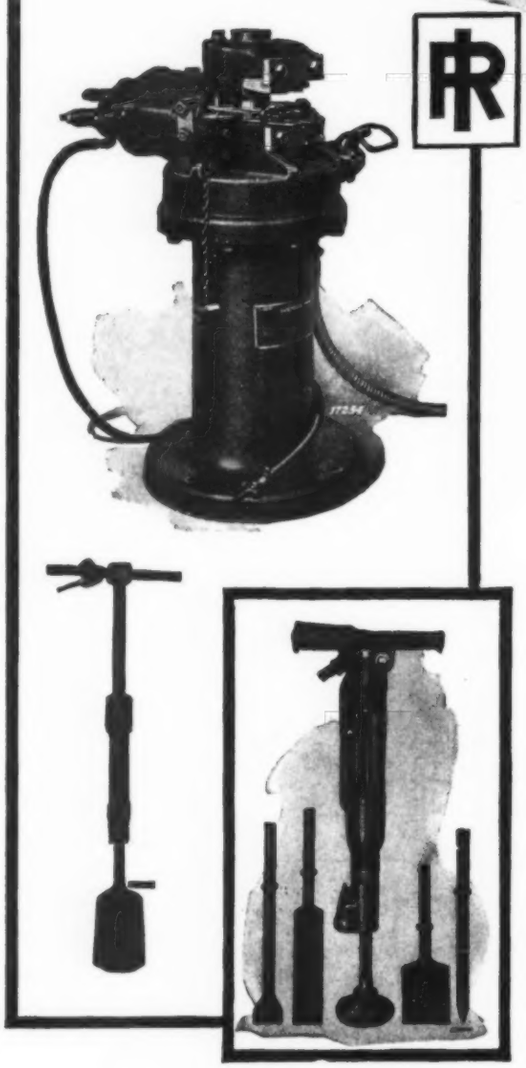
Convertibility

Like all Northwests the Models 2 and 3 are convertible from a shovel to a crane or dragline without putting in or taking out drums. This feature was pioneered by Northwest.

The same high standard of construction and design is apparent at a glance.

The floor plan shows the same Northwest simplicity and get-at-ability, bases are of heavy cast steel, crawlers are self-cleaning, boom sheaves are large assuring long cable life and like the Models 104 and 105 they are shipped on one flat car completely erected.





Extra Profits for

That is what the use of Ingersoll-Rand equipment means. If the machines would not make extra profits for you, we wouldn't build them. Each machine we turn out is designed to help you make short cuts in your work. Every place they are used, they save money for the contractor and permit him to get the work done with the least possible expense.

The fact that Ingersoll-Rand Company takes a personal interest in the operation of its equipment *after* it is sold assures a brand of service that cannot be measured in dollars and cents. The Company maintains a large field organization to show the road builder how to make those extra profits with his I-R equipment, and to insure him against expensive shutdowns by being on the job whenever help is needed.

The following is some of the profit-making equipment offered by the Company:

INGERSOLL-RAND TYPE "TWENTY" PORTABLE AIR COMPRESSORS—built in six sizes; there is a machine for your particular requirement.

"JACKHAMER" ROCK DRILLS—six sizes, the largest of which will drill holes as deep as 25 feet.

"LEYNER" ROCK DRILL STEEL SHARPENERS—three sizes, which will make bits and shanks on any knid or section of rock drill steel.

PAVING BREAKERS—these tools will save 60 per cent of the cost and 75 per cent of the time required by hand methods for tearing up pavement.

TRENCH AND CLAY DIGGERS—one of these pneumatic tools will pick loose enough stiff clay or hard ground to keep five shovellers constantly busy.

PORTABLE HOISTS—the "Utility" Hoist is the answer to all your hoisting and hauling problems.

"CAMERON" DIRECT-ACTING PUMPS—trouble-free, air-driven pumps which will dewater ditches and excavations while the men are preparing for the day's work.

CHIPPING AND CALKING HAMMERS—a pneumatic hammer for each class of work. Unequaled in low cost of maintenance.

Visit our working exhibit, National Good Road Show, Space No. 35, Main Floor, Coliseum, Chicago.

INGERSOLL-RAND COMPANY, 11 Broadway, New York City

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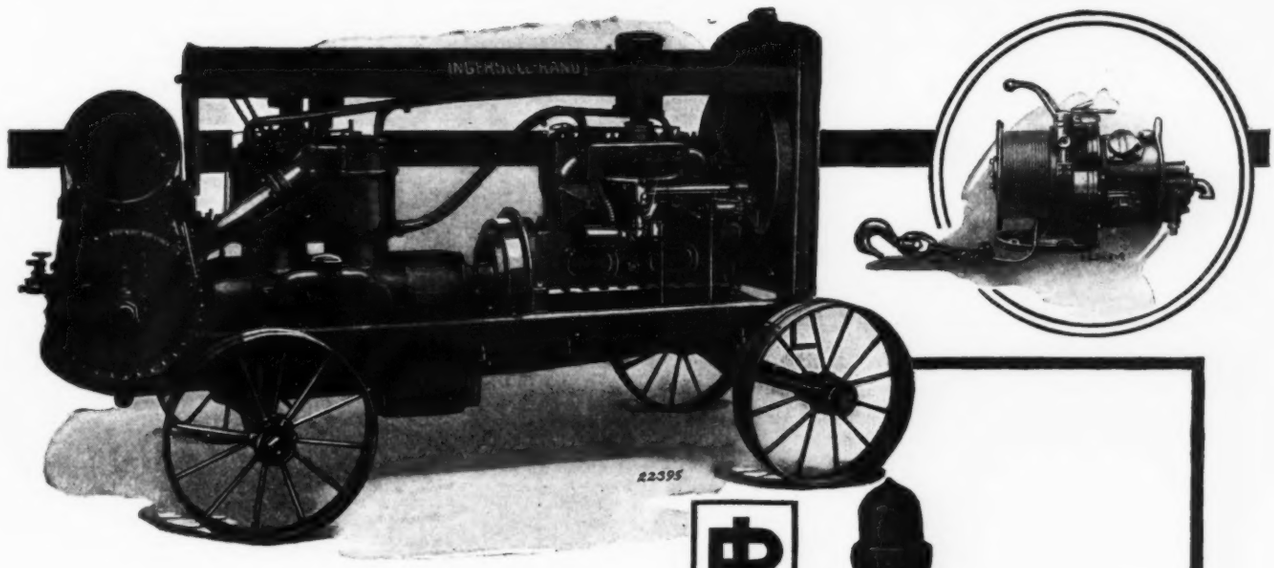


the Road Builder

RIVETING HAMMERS—built in suitable sizes, with inside or outside trigger handles. A size for all grades of work.

WOODBORING MACHINES—powerful, reversible pneumatic drills which will bore holes in wood up to 4 inches in diameter.

The air tools mentioned above are shown on these pages. In addition, the Company manufactures the following tools, which are regularly used with portable compressors in road work:

BACKFILL TAMPER—for tamping backfill. Will ram the fill down hard.

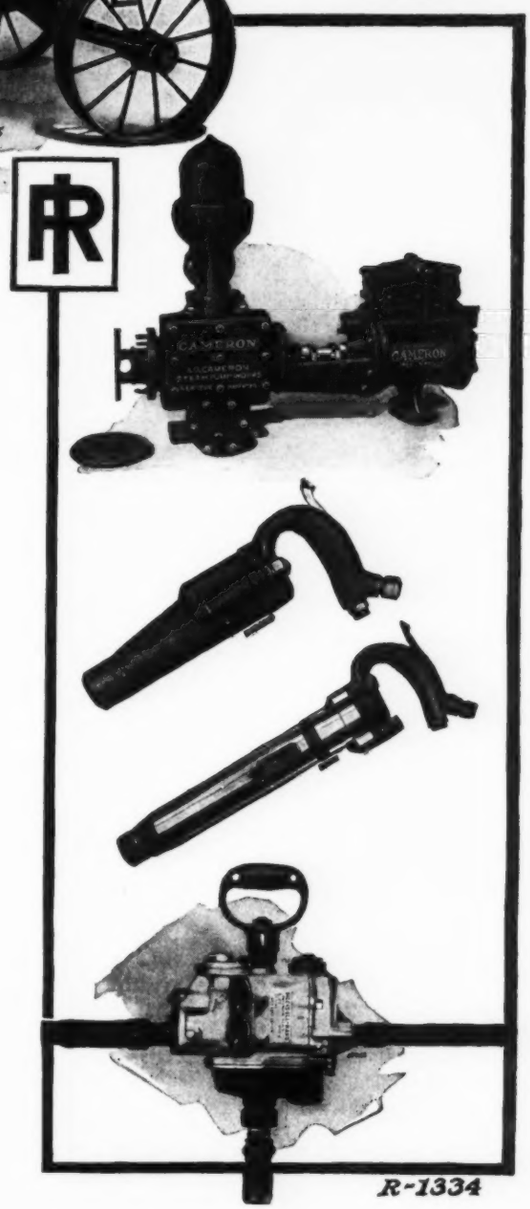
CONCRETE SURFACER—for marking roads, surfacing high spots in concrete, etc.

"DRIFTER" ROCK DRILLS—for extremely hard rock work and deep-hole drilling.

"LEYNER" OIL FURNACES—for heating rock drill steel prior to sharpening.

Fifty years' experience in taking out rock, concrete, and asphalt has equipped our organization with a practical knowledge which is unexcelled by any company in the world. If you are contemplating a difficult rock job, let us furnish a practical rock man to show you the quickest and cheapest way to do your work. This service is free and will be rendered willingly to anyone interested.

It seems needless to emphasize the fact that in all Ingersoll-Rand equipment only the highest-grade materials are used. The most important thing on any contract job is to secure machinery that is sturdy enough to stand abuse and to do the job in the most efficient manner. It is a matter of common knowledge that Ingersoll-Rand equipment has been doing this on thousands of jobs for many years past. With this background, we respectfully request an opportunity to discuss your requirements and solicit your business.



Visit our working exhibit, National Good Road Show, Space No. 35, Main Floor, Coliseum, Chicago.

95-PC

Ingersoll-Rand

A Mouthful at Every Bite

Guarantee
Owen Buckets, properly installed and operated, are guaranteed to do a bigger day's work than any other bucket of the same weight and capacity—
—or—
Write your own guarantee!
OWEN BUCKET CO.

Owen Buckets get "A Mouthful at Every Bite". They're built to dig in, grab a big load---and hold it. Fast, powerful, and extremely sturdy . . . with a type for every job. Scientific design and the best of materials, assure satisfactory performance and the ability to stand up under rough treatment for years . . . and years.

There's an "OWEN" for Every Bucket Job!

Type "J" Digging

CHOOSE a bucket that is specifically designed and constructed for your particular work. Here's the list—one of these Owens will satisfy your bucket needs.

Type "J" Bucket for Digging—For ordinary excavation and unloading compact materials such as Charcoal, Coke, Moist Clay, Clinkers. Sizes in cubic yards—½, ¾, 1, 1¼, and 2.

Type "J" Bucket for Rehandling—from cars or stock pile, materials such as Ashes, Cinders, Small Crushed Stone, Shale. Sizes in cubic yards—⅝, ¾, 1, 1¼, and 2.

Type "O" General Purpose Bucket—For excavating, dredging, and rehandling compact and gritty materials such as Coal, Crushed Stone, Pocket Sand, Gravel. Sizes in cubic yards—½, ¾, 1, 1¼, 1½, 2, 2½, and 3.

Type "S" Clean-up Bucket—For handling and cleaning up materials which are thinly distributed over large areas. Sizes in cubic yards—1, 1¼, 1½, 2, 2½, and 3.

Type "D" Heavy Duty Bucket—For heavy duty excavation, rehandling and dredging. Work in stiff Clay, Broken Slag, Ore, Shale. Sizes in cubic yard—½, ¾, 1, 1¼, 2, 2½ and 3.

Type "DX" Extra Heavy Bucket—For work requiring unusual ability in excavation, rehandling, and dredging. Work in Brick Bats, Limestone, Iron Turnings, Coarse Gravel, Broken Stone. Sizes in cubic yards—1½, 2, 2½, and 3.

Type "W" Snow Bucket—For removing snow and broken ice. A swift-moving and efficient bucket of proven ability. Sizes in cubic yards—1½—weight 2000 lbs. and 2400 lbs. (Not illustrated).

Type "S"

Type "J" Rehandling

Type "D"

Type "O"

Type "DX"

Write for a copy of the illustrated folder which tells about the Nine Points of OWEN Superiority—free on request.

The OWEN BUCKET Company
6023 Breakwater Avenue · Cleveland, Ohio

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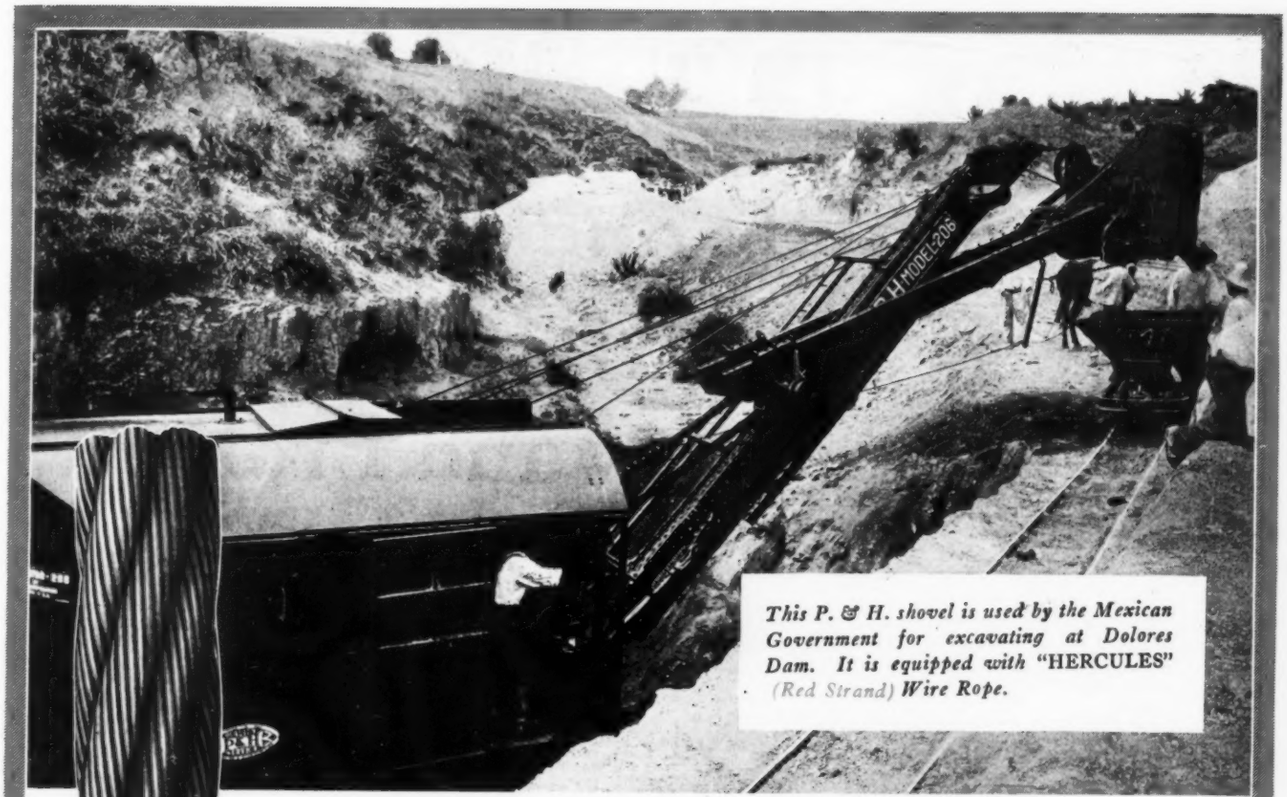
St. Louis San Francisco Tampa

OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAYS WORK

Owen Buckets



This P. & H. shovel is used by the Mexican Government for excavating at Dolores Dam. It is equipped with "HERCULES" *(Red Strand) Wire Rope.*

Where Economy Depends on Durability

Material handling equipment is built for heavy duty, consequently the wire rope used must be exceedingly sturdy if best results are to be had.

"HERCULES" (Red-Strand) Wire Rope is extra strong and extra wear resisting because it is made of acid steel, and every wire is first rigidly tested by us to make sure that it has every quality that hard work requires.

Because of its great strength and uniform durability, "HERCULES" Wire Rope is not only able to handle the most tonnage for each dollar of its cost, but it also speeds up the work by cutting down time lost for rope changes.

If you have any wire rope problems we would be glad to help you solve them. Write for free copy of our booklet— "Practical Information on the Use and Care of Wire Rope."

The Wire Rope with the Service Record

Made Only By **A. Leschen & Sons Rope Co.** Established 1857

5909 Kennerly Avenue
ST. LOUIS

New York Chicago Denver San Francisco

INDEPENDENT
Reinforced Concrete Pipe

Laying an INDEPENDENT 42-inch concrete sewer at Niles, Ill. Note how closely pipe-laying follows the excavating.

Permanence and Profit

In Building Storm and Sanitary Sewers

CONTRACTORS who use INDEPENDENT Reinforced Concrete Pipe get the kind of material and service that mean greater PERMANENCE in the completed sewer, and a larger PROFIT on each job.

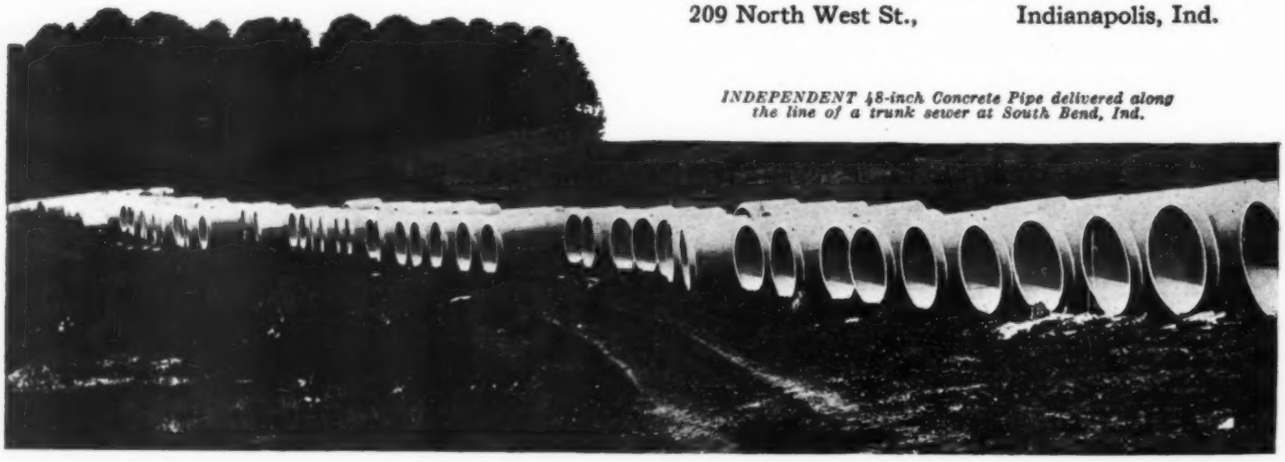
They get precast concrete pipe of highest quality, built strictly to specifications by concrete specialists. And they get the pipe right when and where they want it—built on the job, or near by and delivered along the trench, ready to lay.

INDEPENDENT Pipe can be laid faster and at lower cost—the simple "Recessed Joint" is sealed INSIDE the pipe for the lower half, and OUTSIDE the pipe for the upper half. The easiest joint to seal under *all* trench conditions! Backfilling can follow as fast as each joint is sealed.

Before you bid on any 1927 concrete sewer work, get in touch with us. We can show you some interesting economies and advantages. Write, wire or phone us. (Main 2131.)

INDEPENDENT CONCRETE PIPE CO.
209 North West St., Indianapolis, Ind.

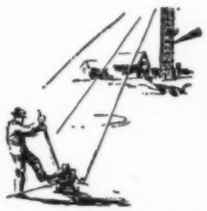
INDEPENDENT 48-inch Concrete Pipe delivered along the line of a trunk sewer at South Bend, Ind.



Learn More About This Time and Labor Saver

Send the coupon below for more information about this little device. Handy-Andy is the pulling jack of all trades. Contractors, street repair departments, water departments, mines, oil producers, refiners, gas companies, light and power companies, drainage boards, factories, dredgers, roadbuilders—all find him a time and labor saver on many jobs.

10 to 40 Tons Line Pull. Handy-Andy is **Portable,** compact, light. Works on ratchet principle. Handier than a lifting jack. Works in close quarters. Saves tying up big, expensive equipment. Simple to operate, little to get out of order. Soon pays for itself.



Tighten Guy Lines Easily

This powerful little tool insures rigidly tight guy lines and cables on aerial tramways with a few ratchet movements of the handle.

Pulling Pipe and Closing-up Pipe Sections

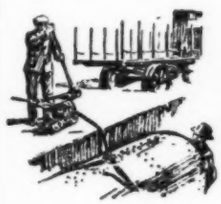
Handy-Andy is just the tool for pulling used pipe and closing up aqueduct and heavy pipe sections.

Pull Heavy Forms Quickly

Handy-Andy is a convenient, powerful, compact tool for form removal on all classes of work in crowded quarters.

Pull Trees and Small Stumps

Parks, development contractors, road builders—all find Handy Andy a money saver on this kind of work.



Move and Set Boilers

The automatic reverse on Handy-Andy makes it possible to have absolute control of heavy equipment when lowering.

Pull Sheet Piling

After the crane has gone use Handy-Andy to yank out the sheet piling. Pulls all kinds of piling.

Move Heavy Machinery

Factories, contractors and riggers find Handy-Andy an invaluable piece of equipment for this work because of its tremendous capacity.

Yank Out Stalled Trucks

Every Operator of motor fleets needs a Handy-Andy on his emergency car.

Use Handy-Andy for—

- Pulling Bridge Floors
- Setting Big Valves and Meters
- Binding Pile Clusters
- Installing Culverts
- Demolition and Wrecking
- Moving Tanks and Houses
- Sinking and Pulling Well Casing
- Loading and Unloading Heavy Machinery
- Pulling old piling
- Rerailing Rolling Stock
- Dock and Bridge Construction
- Moving Transfer Cars
- Spotting Cars Short Distances

Hoist Heavy Towers

Handy-Andy enables the operator to hoist heavy towers with perfect control over them at all times.

String Transmission Wires

An invaluable tool for tightening all kinds of lines on line construction and in overhead departments.

For Conduit Work

Because of its compact size and shape Handy-Andy can be used in inaccessible places. The tool for pulling out and replacing grounded cable.

Move Barges Easily

No need to tie up other expensive equipment moving heavy barges into slips or to unloading shovels.

Shift Track with Handy-Andy

On refuse dumps in strip mines, on railroad maintenance—one man can do the work of two or three and faster.

Manufactured by

JOHN WALDRON CORPORATION
New Brunswick, N. J.
(Est. 1827)

Reg. U. S. Patent Office

HANDY-ANDY

THE BIG LITTLE *PULLER* FOR CONTRACTORS

John Waldron Corporation, New Brunswick, N. J.

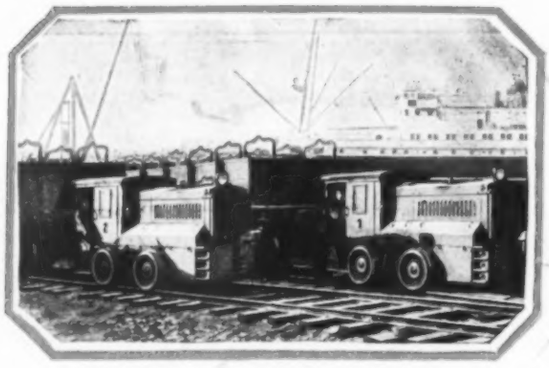
Please send me prices of Handy-Andy Pulling Jack and bulletin showing rigging.

Could I use it for.....?

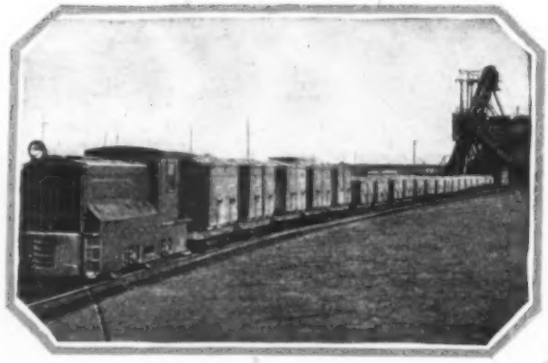
Name.....

Firm.....

Address.....



THE SIDNEY E. JUNKINS CO., B. C. LTD.
VANCOUVER, B. C.



KAISER PAVING COMPANY
OAKLAND, CALIF

BENT BROS., INC.
LOS ANGELES, CALIF.

From Coast

Plymouths Predominate In

A Partial List of Users—

Number Bought		
7	Aaby & Maturi	Chisholm, Minn.
2	Aberthaw Construction Co.	Boston
3	Allport Construction Co.	Richmond, Va.
6	Armstrong-Whitworth Co.	Sidney, Newfoundland
11	Arundel Corp., The	Baltimore
3	Baker & Sons, J. H.	Detroit
6	Baker, R. D.	Detroit
4	Baker-Royer Co.	Richmond, Va.
4	Bent Bros.	Los Angeles
2	Brooks Construction Co.	Fort Wayne, Ind.
6	Bryant & Detwiler	Detroit
3	Butler Bros. Building Co.	St. Paul, Minn.
2	Callahan-Cooney Construction Co.	Los Angeles
3	Capitol Construction Co.	Des Moines, Ia.
7	Carpenter, Harry A.	Evansville, Ind.
2	Carter-Halls-Aldinger Co.	Winnipeg
4	Central Engineering Co.	Davenport, Ia.
5	Cogan Co., J. F.	New York
3	Cohen, Inc., Frank L.	Buffalo
4	Consolidated Engineering Co.	Baltimore
2	Continental Eng. & Construction Co.	West Palm Beach, Fla.
5	Cooke, Geo. R.	Detroit
7	Coons Co., E. W.	Hibbing, Minn.
3	Cook-O'Brien Construction Co.	Kansas City
2	Coral Gables Construction Co.	Larkin, Fla.
5	Culbertson Co., H. E.	Cleveland
7	Cunningham Construction Co.	Indianapolis
13	Currie, Thos. E.	Detroit
7	Dravo Contracting Co.	Pittsburgh
7	Dunnegan, J. J.	Shenandoah, Ia.
8	Empire Construction Co.	Baltimore
2	Flick Construction Co.	Vollanda, Kans.
6	Foley Co., D. A.	Los Angeles
6	Foundation Co.	New York
3	Gifford Construction Co.	Dallas, Tex.
2	Groves & Sons Co., S. J.	Minneapolis
3	Grove Co. & Shepard	Duluth
3	Healy-Tibbetts Construction Co.	San Francisco
13	Hecker Co., The A. S.	Cleveland
2	Heller Construction Co., H. E.	San Francisco
6	Heyworth, Jas. O.	Chicago
2	Highway Improvement Co.	South Bend, Ind.
4	Hill & Hill	Elyria, O.
2	Holbrook, Cabot & Rollins Corp.	Boston
2	Homberger & Wagar Eng. & Const. Co.	Sandusky, O.
6	Hutchinson, W. B.	Michigan City, Ind.
2	Hutchinson Construction Co.	Oakland, Calif.
5	Indiana Road Paving Co.	Rochester, Ind.
4	Industrial Haulage Corporation	Jacksonville, Fla.
2	Jaickes Brothers	Chicago
2	Junkins Co., Ltd., Sydney E.	Vancouver, B. C.
6	Kaiser Paving Co.	Oakland, Calif.
4	Kelly Co., John F.	Terre Haute, Ind.
7	Keystone State Construction Co.	Philadelphia

Plymouth Locomotives are made in 3 to 25-ton sizes and in any gauge of

THE FATE-ROOT-HEATH COMPANY,

PLYM

Gasoline

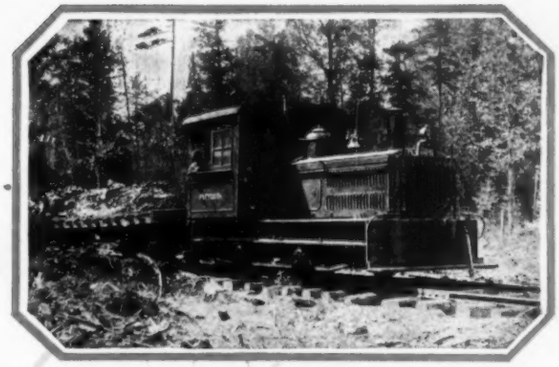
to Coast

General Construction Work

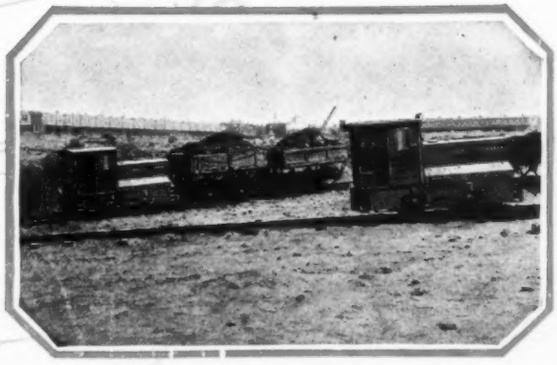
Note the Repeat Orders

Number Bought		
4	Koss Construction Co.	Des Moines, Ia.
6	Lennane, W. E.	Detroit
3	Lonergan Construction Co., W. D.	Streator, Ill.
3	Louisville Hydro-Electric Co.	Louisville, Ky.
5	Mason-Hanger Construction Co.	Lexington, Ky.
7	McCarthy Improvement Co.	Davenport, Ia.
3	McGraw Co., James	Philadelphia
7	McKay, Jas. A.	Detroit
9	McLean Contracting Co.	Baltimore
3	McMahan Construction Co.	Rochester, Ind.
2	Mead-Balch Construction Co.	Indianapolis
5	Meneely Co., Wm. C.	Decatur, Ill.
5	Mellon Construction Co.	Chicago
2	Mellert-Weidner Co., Geo. S.	Medina, O.
6	Mercier, J. A.	Detroit
3	Mitchell Contracting Co., Frank	Greenville, N. C.
3	Morrow & Son, R. S.	Omaha, Neb.
2	Nelson, Fulton & Nelson	Minneapolis
7	O'Neil Sons Co., Wm.	Faribault, Minn.
10	Orr, Joseph (Chicago Heights Coal Co.)	Chicago
4	Pacific Coast Paving Co.	Tacoma, Wash.
3	Pacific Construction Co.	Vancouver, B. C.
7	Parrish, Alan Jay	Paris, Ill.
4	Phoenix Utility Co.	New York
5	Porath, Ferdinand	Detroit
4	Porath, Julius	Detroit
2	Reynolds Contracting Co., T. H.	New York
7	Rieth-Riley Construction Co.	Goshen, Ind.
5	Rolandi, F.	San Francisco
3	Ryan Construction Co.	Philadelphia
11	Scharl, G. P.	Grand Rapids, Mich.
6	Schaefer Construction Co., J. A.	St. Louis
9	Schoentag, David	Saugerties, N. Y.
4	Shawinigan Engineering Co.	Montreal
3	Siems, Helmers & Schaffner	St. Paul
4	Smith & Co., W. F.	Barnhart, Mo.
4	Smith & Co., Grant	St. Paul
5	Smith Construction Co., A. J.	Detroit
3	Stanton & Son, James	Leavenworth, Kans.
2	Stewart & Welch Construction Co.	San Francisco
2	Stone & Webster	New York
2	Stresenreuter Bros.	Chicago
5	Thompson-Starrett Co.	New York
7	Tri-State Construction Co.	Bridgeton, N. J.
3	Turner Construction Co.	New York
5	Union Bridge & Construction Co.	Kansas City
4	Walsh Construction Co.	Davenport, Ia.
36	Wayne County (Mich.) Road Commissioners	Detroit
4	West Construction Co.	Chattanooga, Tenn.
6	Williams, Roy L.	Charleston, Mo.
6	Winston Bros. Co.	Minneapolis
2	Winston-Dear Co.	Minneapolis
5	Winston & Co.	Kingston, N. Y.
3	Woods Bros. Construction Co.	Lincoln, Neb.

PLYMOUTH, OHIO, U.S.A.



GREAT NORTHERN PAPER CO
BANGOR, MAINE



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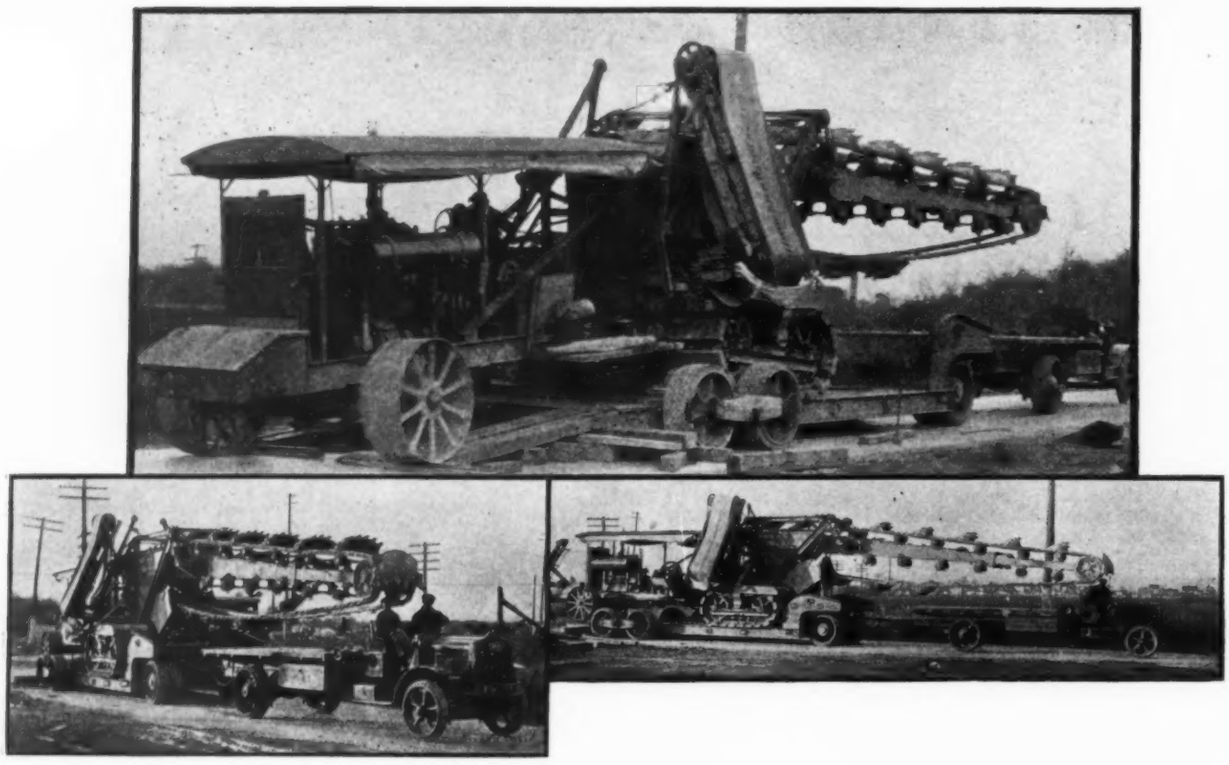
BALTIMORE, MD.

INDUSTRIAL HAULAGE CORPORATION
ST. AUGUSTINE, FLA.

Write for Catalog and Performance Bulletins.

PLYMOUTH Locomotives



45 tons —

Pick up and go

What a job it is to move a big job like this any distance under its own power—slow beyond patience—hard on the machine—hard on roads.

So the owners of this Buckeye Trench Machine load it on a Rogers Trailer—move the 45 tons of weight and bulk with no more trouble than they'd have with a grand piano. Pick up and go any time—saves time, saves the machine, saves roads.

Rogers Trailers in four, six, and eight wheel types—capacities up to 50 tons move enormous loads quickly, without exceeding allowable load per wheel.

Low hung platform makes loading easy, and keeps the load low, construction is amply strong for capacity loads. Roller bearings make pulling and steering easy.

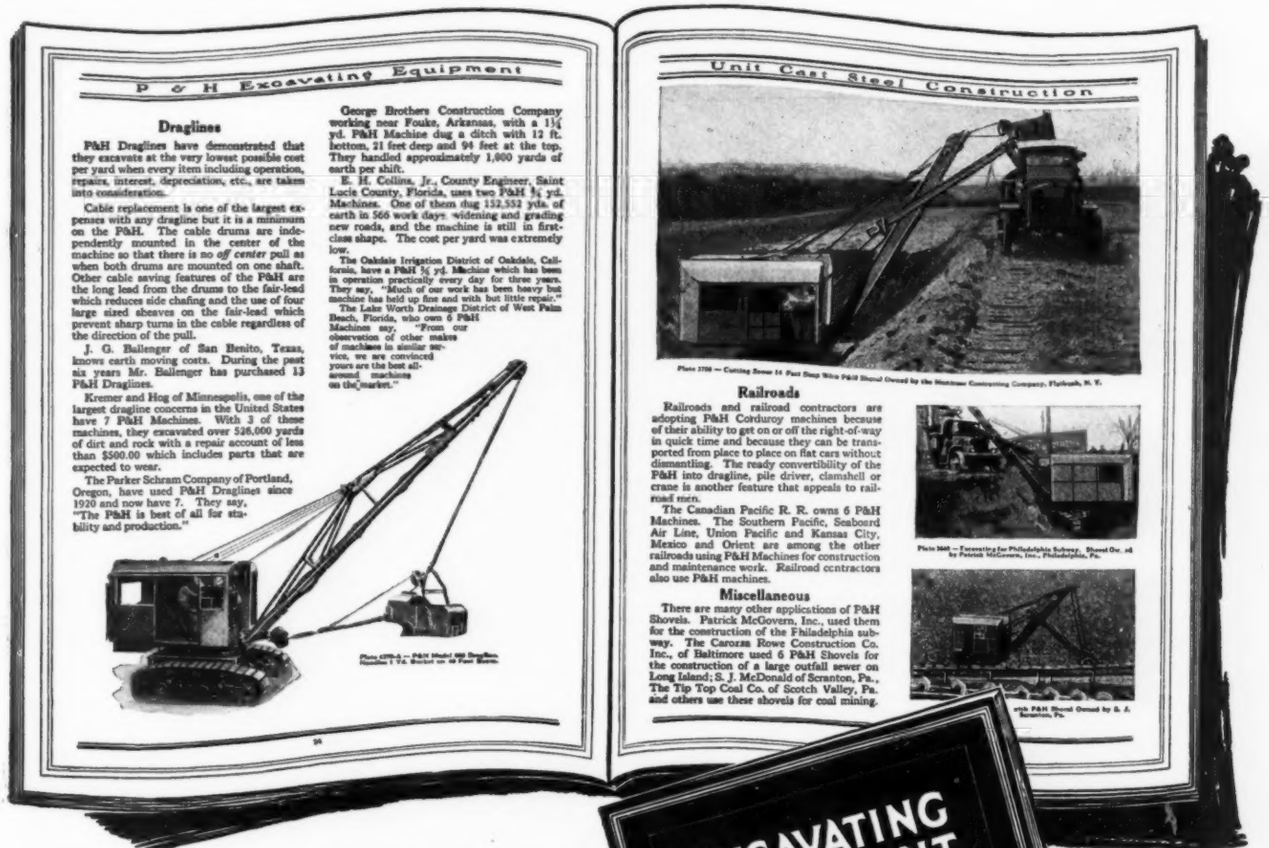
If you have to move big, heavy machinery, get prices on Rogers Trailers.

Rogers Brothers Corporation

ALL STEEL TRAILERS—from One to 50 Tons

Albion, Pa.

Get the New Bulletin 61 X


P & H Excavating Equipment
Draglines
P&H Draglines have demonstrated that they excavate at the very lowest possible cost per yard when every item including operation, repairs, interest, depreciation, etc., are taken into consideration.
Cable replacement is one of the largest expenses with any dragline but it is a minimum on the P&H. The cable drums are independently mounted in the center of the machine so that there is no off center pull as when both drums are mounted on one shaft. Other cable saving features of the P&H are the long lead from the drums to the fair-lead which reduces side chafing and the use of four large sized sheaves on the fair-lead which prevent sharp turns in the cable regardless of the direction of the pull.
J. G. Ballenger of San Benito, Texas, knows earth moving costs. During the past six years Mr. Ballenger has purchased 13 P&H Draglines.
Kremer and Hog of Minneapolis, one of the largest dragline concerns in the United States have 7 P&H Machines. With 3 of these machines, they excavated over 526,000 yards of dirt and rock with a repair account of less than $500.00 which includes parts that are expected to wear.
The Parker Schram Company of Portland, Oregon, have used P&H Draglines since 1920 and now have 7. They say, "The P&H is best of all for stability and production."
George Brothers Construction Company working near Fouke, Arkansas, with a 1¼ yd. P&H Machine dug a ditch with 12 ft. bottom, 21 feet deep and 94 feet at the top. They handled approximately 1,000 yards of earth per shift.
E. H. Collins, Jr., County Engineer, Saint Lucie County, Florida, uses two P&H ¾ yd. Machines. One of them dug 152,552 yds. of earth in 566 work days widening and grading new roads, and the machine is still in first-class shape. The cost per yard was extremely low.
The Oakdale Irrigation District of Oakdale, California, have a P&H ¾ yd. Machine which has been in operation practically every day for three years. They say, "Much of our work has been heavy but machine has held up fine and with but little repair."
The Lake Worth Drainage District of West Palm Beach, Florida, who own 6 P&H Machines say, "From our observation of other makes of machines in similar service, we are convinced yours are the best all-around machines on the market."
Unit Cast Steel Construction
Railroads
Railroads and railroad contractors are adopting P&H Corduroy machines because of their ability to get on or off the right-of-way in quick time and because they can be transported from place to place on flat cars without dismantling. The ready convertibility of the P&H into dragline, pile driver, clamshell or crane is another feature that appeals to railroad men.
The Canadian Pacific R. R. owns 6 P&H Machines. The Southern Pacific, Seaboard Air Line, Union Pacific and Kansas City, Mexico and Orient are among the other railroads using P&H Machines for construction and maintenance work. Railroad contractors also use P&H machines.
Miscellaneous
There are many other applications of P&H Shovels. Patrick McGovern, Inc., used them for the construction of the Philadelphia subway. The Carozza Rowe Construction Co. Inc., of Baltimore used 6 P&H Shovels for the construction of a large outfall sewer on Long Island; S. J. McDonald of Scranton, Pa., The Tip Top Coal Co. of Scotch Valley, Pa. and others use these shovels for coal mining.

Proved Machines Again Improved

THE new 56-page P&H Bulletin 61-X is the largest and most complete book ever published on gasoline excavators.

The illustrations of machines in service—P&H Shovels, Draglines, Cranes, Hoes—with the careful discussion of all details of construction, make this book of interest and value to all construction engineers, contractors, and operators.

Like P&H sales engineers, this book does not avoid explaining all details. There is no attempt to steer you away from facts—we know that when you are considering an investment in an excavator you *are* interested in knowing all about the machine you are buying.

We welcome the opportunity of showing you that even in the smaller details there is that same evidence of P&H thoroughness that means better and longer service at lower cost to the purchaser.

But—mail the coupon today—there is no obligation.

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Established in 1884
3894 National Avenue, Milwaukee, Wis.

New York	*Philadelphia*	*Detroit*	*Indianapolis*	*Atlanta*
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WAREHOUSES AND SERVICE STATIONS
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Send a copy of your new gasoline excavator bulletin—61X—to the address given below.

Name.....
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Name.....
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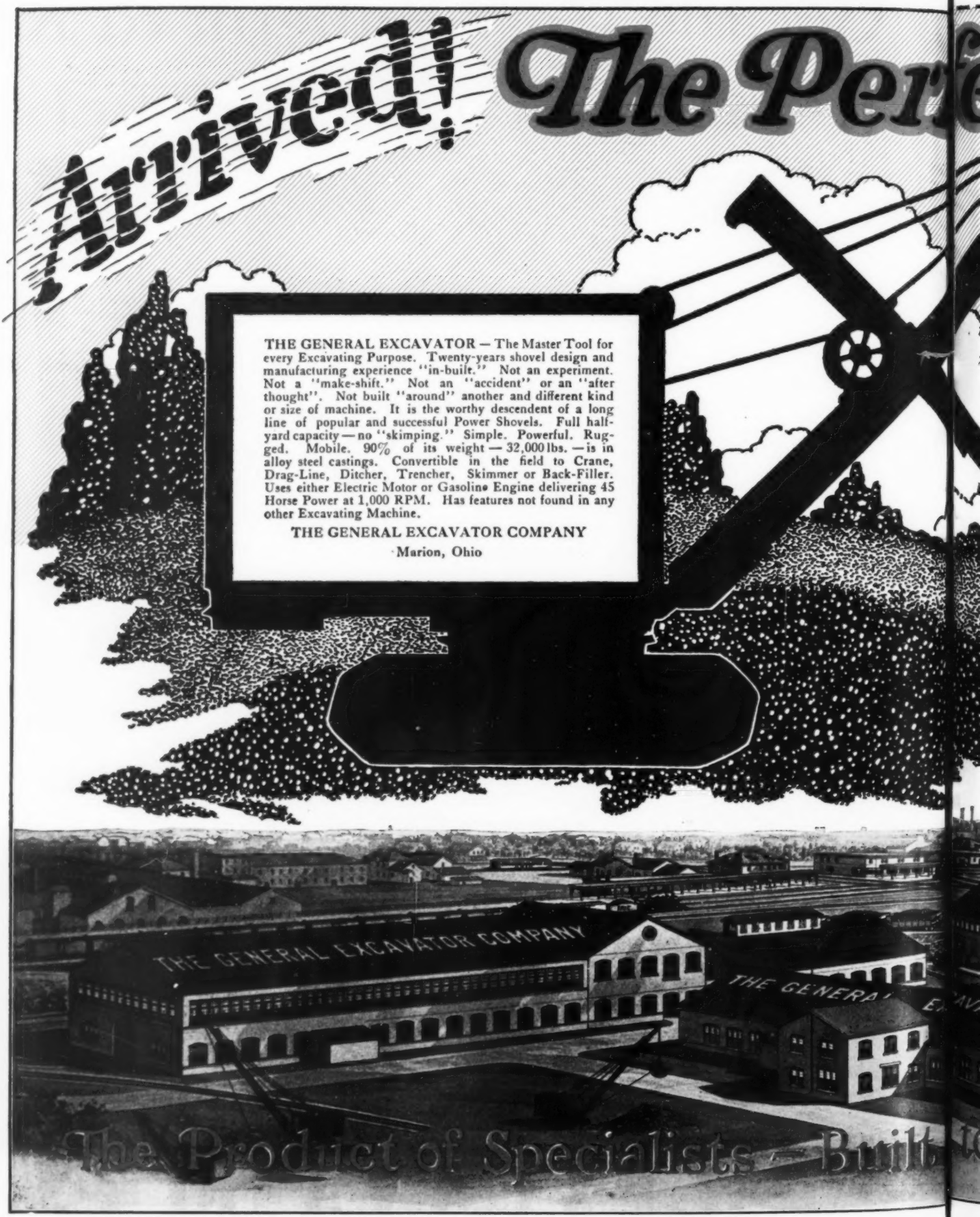
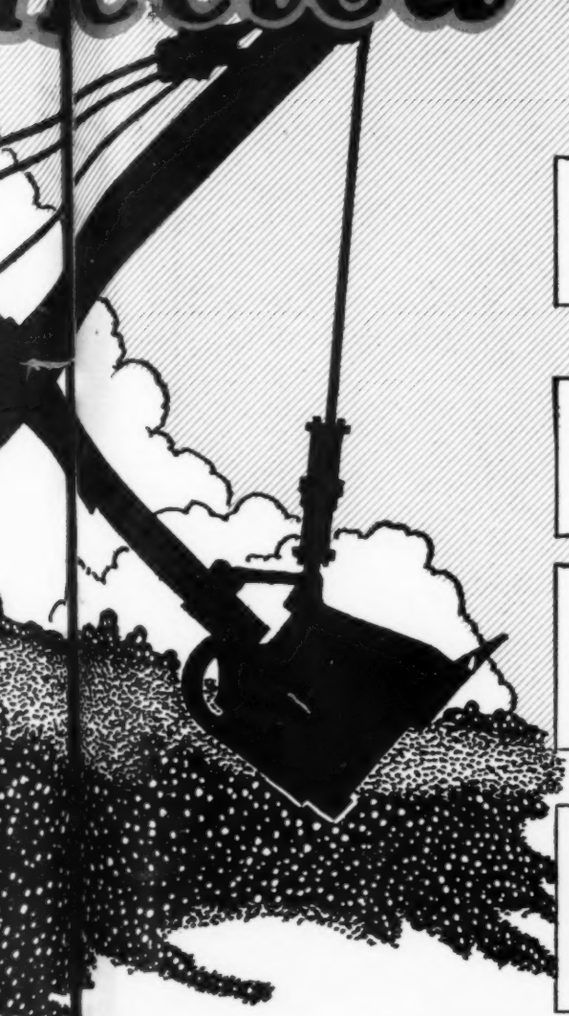
City..... State..... 3894

P&H EXCAVATORS


Arrived!
The Perf
THE GENERAL EXCAVATOR — The Master Tool for every Excavating Purpose. Twenty-years shovel design and manufacturing experience "in-built." Not an experiment. Not a "make-shift." Not an "accident" or an "after thought". Not built "around" another and different kind or size of machine. It is the worthy descendent of a long line of popular and successful Power Shovels. Full half-yard capacity — no "skimping." Simple. Powerful. Rugged. Mobile. 90% of its weight — 32,000 lbs. — is in alloy steel castings. Convertible in the field to Crane, Drag-Line, Ditcher, Trencher, Skimmer or Back-Filler. Uses either Electric Motor or Gasoline Engine delivering 45 Horse Power at 1,000 RPM. Has features not found in any other Excavating Machine.
THE GENERAL EXCAVATOR COMPANY
Marion, Ohio
THE GENERAL EXCAVATOR COMPANY
The Product of Specialists — Built

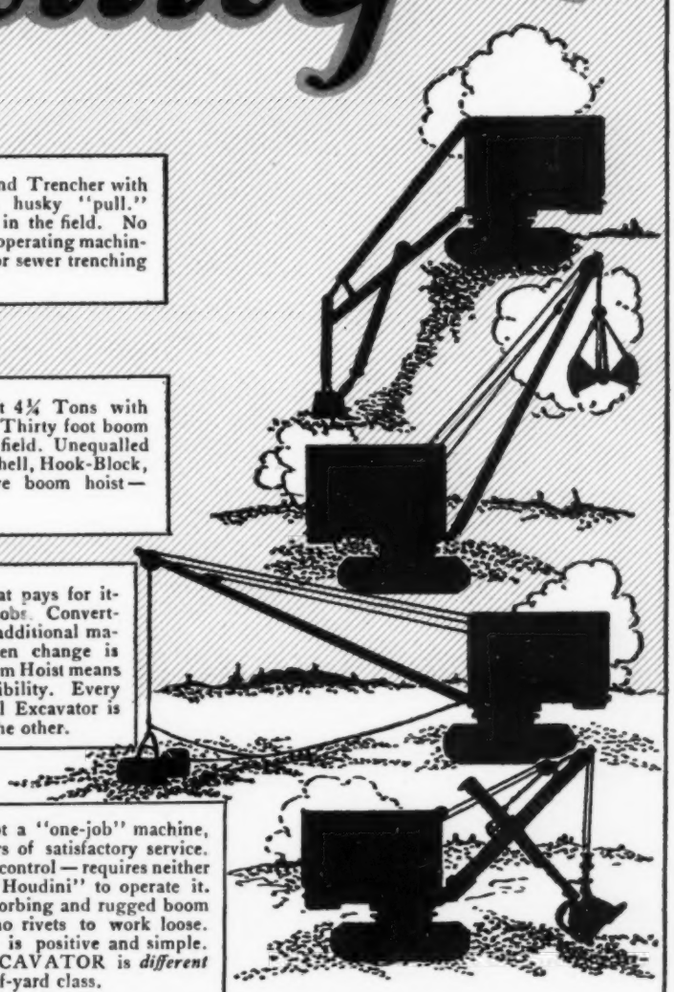
Visit Our Booth at Chicago Road Show, NCB 71, The Coliseum, January 10th-14th

rfected Utility—



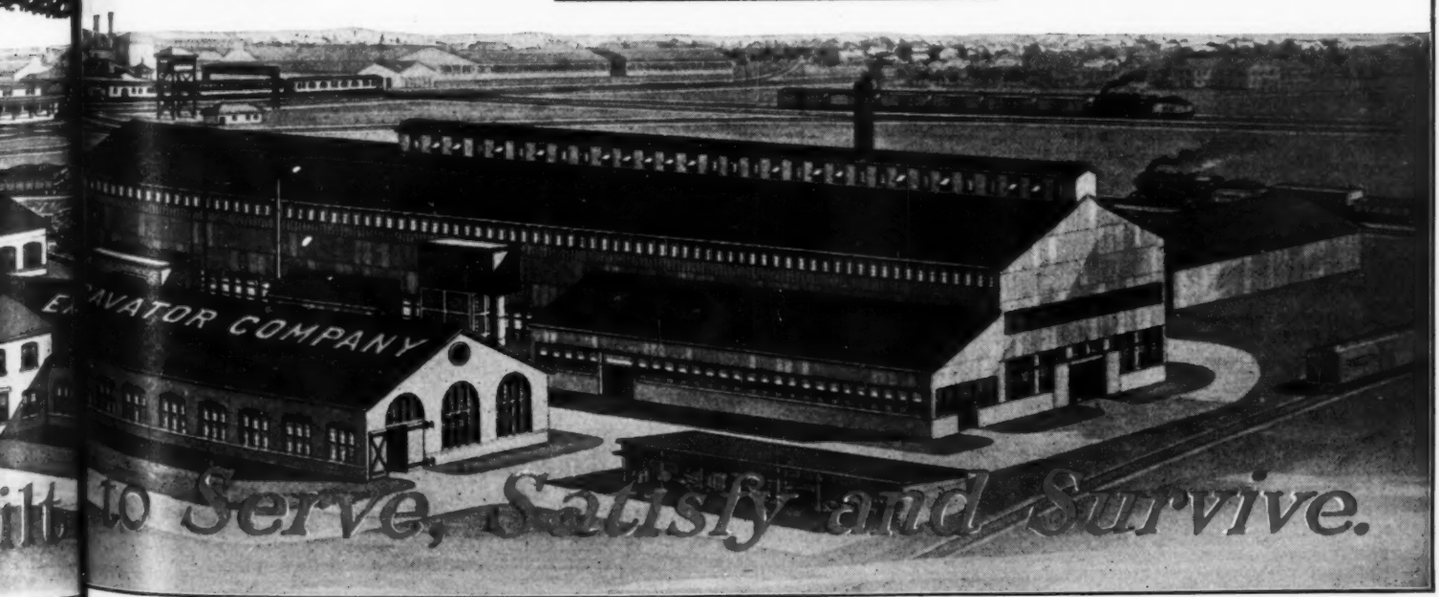
A Powerful Ditcher and Trencher with a long reach and a husky "pull." Boom can be changed in the field. No additional hoisting or operating machinery necessary. Ideal for sewer trenching and ditch digging.

As a Crane it can lift 4¼ Tons with boom at 12' radius. Thirty foot boom can be installed in the field. Unequalled as Pile-Driver, Clam-Shell, Hook-Block, Magnet, etc. Has live boom hoist—quick handling.



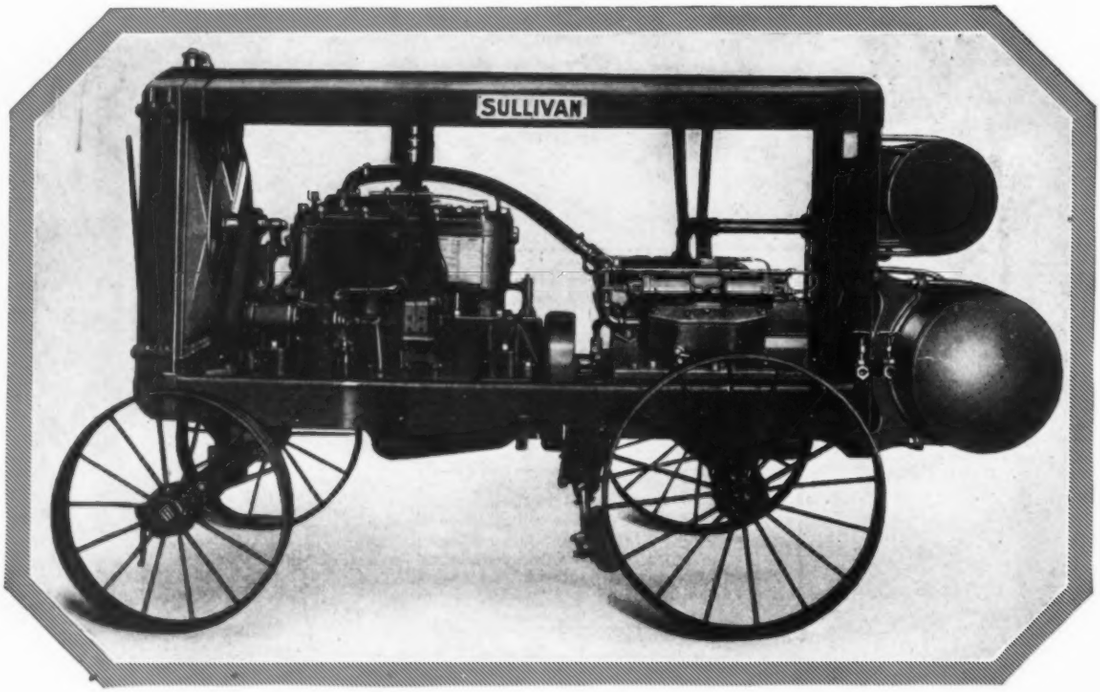
A Real Drag-Line that pays for itself with a few small jobs. Convertible in the field. No additional machinery necessary when change is made. Live Power Boom Hoist means big yardage and flexibility. Every Boom for the General Excavator is interchangeable with the other.

The Ideal Shovel. Not a "one-job" machine, but built to give years of satisfactory service. Has the "easy-touch" control—requires neither a "Samson" nor a "Houdini" to operate it. Long-lived, shock-absorbing and rugged boom and dipper stick—no rivets to work loose. Crowding mechanism is positive and simple. The GENERAL EXCAVATOR is *different* and is *alone* in the half-yard class.



to Serve, Satisfy and Survive.

Visit Our Booth at Chicago Road Show, NCB 71, The Coliseum, January 10th-14th



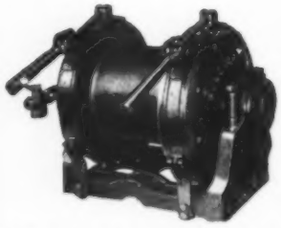
Come to the Road Show!

Concrete Breaker

See the Sullivan Exhibit, then—resolve for 1927 to "Speed up with Air"—and Sullivan Air Power Equipment. You will be welcome at our two (2) booths, in The Coliseum and in The Wilson Bldg. You will see Sullivan Portable Compressors, Hammer Drills, "Busters," "Spaders," a "Turbinair" Hoist, and a Drill Sharpener actually making bits.

"Rotator"

For construction and maintenance requiring rock drilling, concrete removal, clay digging, spray painting, riveting, drilling wood or metal, a SULLIVAN PORTABLE COMPRESSOR will help cut labor costs and speed up the job. Sizes are 110-170-220-320 cu. ft. Gasoline engine driven compressors are direct-connected to Buda tractor type units, and mounted on steel or rubber tired wheels, highway trailor trucks, or skids.



Sullivan Portable Turbinair Hoist

SULLIVAN PORTABLE HOISTS are built in air, steam or electric, single or two drum models, 6½ hp. They have 2000 lb. capacity on vertical lift, or will pull a 50-ton car on level track. They can be used for derricks, material hoists, dragline, caisson work, etc.

"ROTATORS," "BUSTERS" and "SPADERS" are rapid, powerful, convenient hammer drills for rock, concrete, or clay removal. An outfit of these tools plus a portable compressor, will save much time and labor on any outdoor job. *Send for Our Pictorial Booklet, "Speed Up With Air."*

Clay Spader

SULLIVAN MACHINERY COMPANY

166 SOUTH MICHIGAN AVE. CHICAGO, ILLINOIS, U. S. A.

NEW YORK PITTSBURGH ST. LOUIS SAN FRANCISCO

See them at the Road Show
UNIVERSALS
SPACE N. C. 20
See the Universal Crane—
and the additional crane attachments and developments that will further increase the all-purpose ability, application and Earning Power of the Reliable Money Making UNIVERSAL.
Ask for Bulletin No. 36 E E
The Universal Crane Co.
952 Swetland Building Cleveland, Ohio
UNIVERSAL

Visit BLAW-KNOX at the Road Show

You Will See —

BINS (Steel)

Self-cleaning—portable bins—which take minutes for erection instead of days. Any Batcherplant can be equipped interchangeably for measurement of aggregates, by volume, by weight or by Inundation.

BATCHERS

Bins built of wood, steel or concrete can be equipped with Blaw-Knox adjustable Volume Batchers, Weighing Batchers, or the Blaw-Knox Inundator for making constant concrete. Speedy operation.

INUNDATION

You will see how it will increase your yield with no additional cost—how over-run of cement is prevented—how uniform concrete is obtained by absolute water control.

BUCKETS

Have a look into the workings of a husky Dreadnaught. Study its rugged build and thorough lubrication principles, and realize why we can say ***absolutely guaranteed.***

ROAD FORMS

Learn how easy it is to keep Blaw-Knox Road Forms in perfect alignment and grade. See the ¼ inch thick lock joint, the "easy to clean" stake pockets—the one piece stake strap—the reinforced construction.

STREET AND SIDE WALK FORMS

See how Blaw-Knox Steel Forms save time in form setting and eliminate labor and lumber when building curbs, integral base and curb, sidewalks, and gutters.

CALCIUM CHLORIDE MACHINE

A machine which introduces the exact amount of calcium chloride into the batch to effect proper curing with greater speed and economy. It attaches to paver or can be used separately.

TURNTABLES

Save wear and tear on motor trucks. Preserve carefully rolled subgrades and keep the paver and men busy with a steady flow of materials.

BUILDINGS

The Blaw-Knox Steel Building is ideal for housing men, materials and equipment. Permanent buildings which can be easily moved.

STEEL FORMS

A set of Blaw-Knox Steel Wall Forms will pay for itself quickly. Better walls, foundations, etc., can be built at a lower labor and material cost. Every contractor should own a set of Blaw-Knox Steel Wall Forms.

We especially invite your attention to our Inundation exhibit—discuss with us its application to the building of roads.

Learn how Inundation (in addition to its widespread use on general construction work) has also been used with wonderful results on road construction.

Visit us at Space No. 51

BLAW-KNOX

BLAW-KNOX COMPANY

682 FARMERS BANK BLDG., PITTSBURGH, PA.

NEW YORK · CHICAGO · BALTIMORE · BUFFALO · BIRMINGHAM
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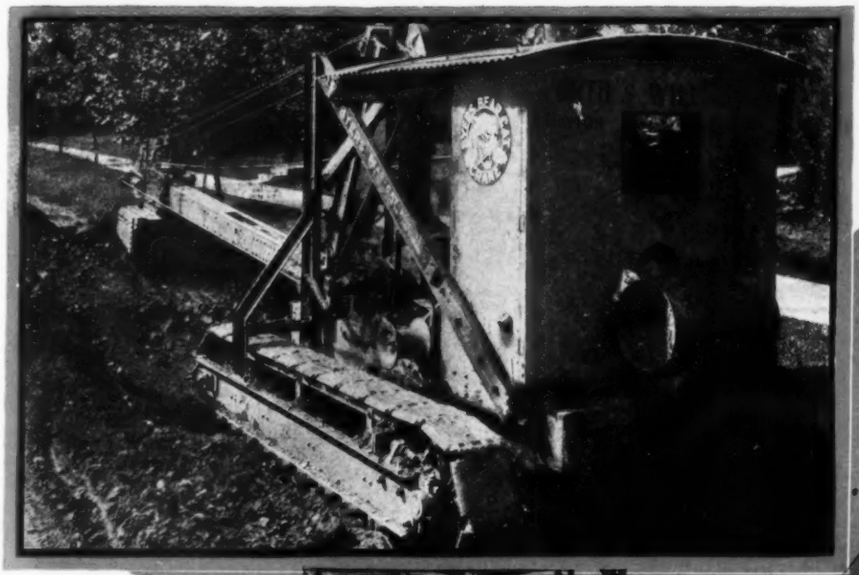
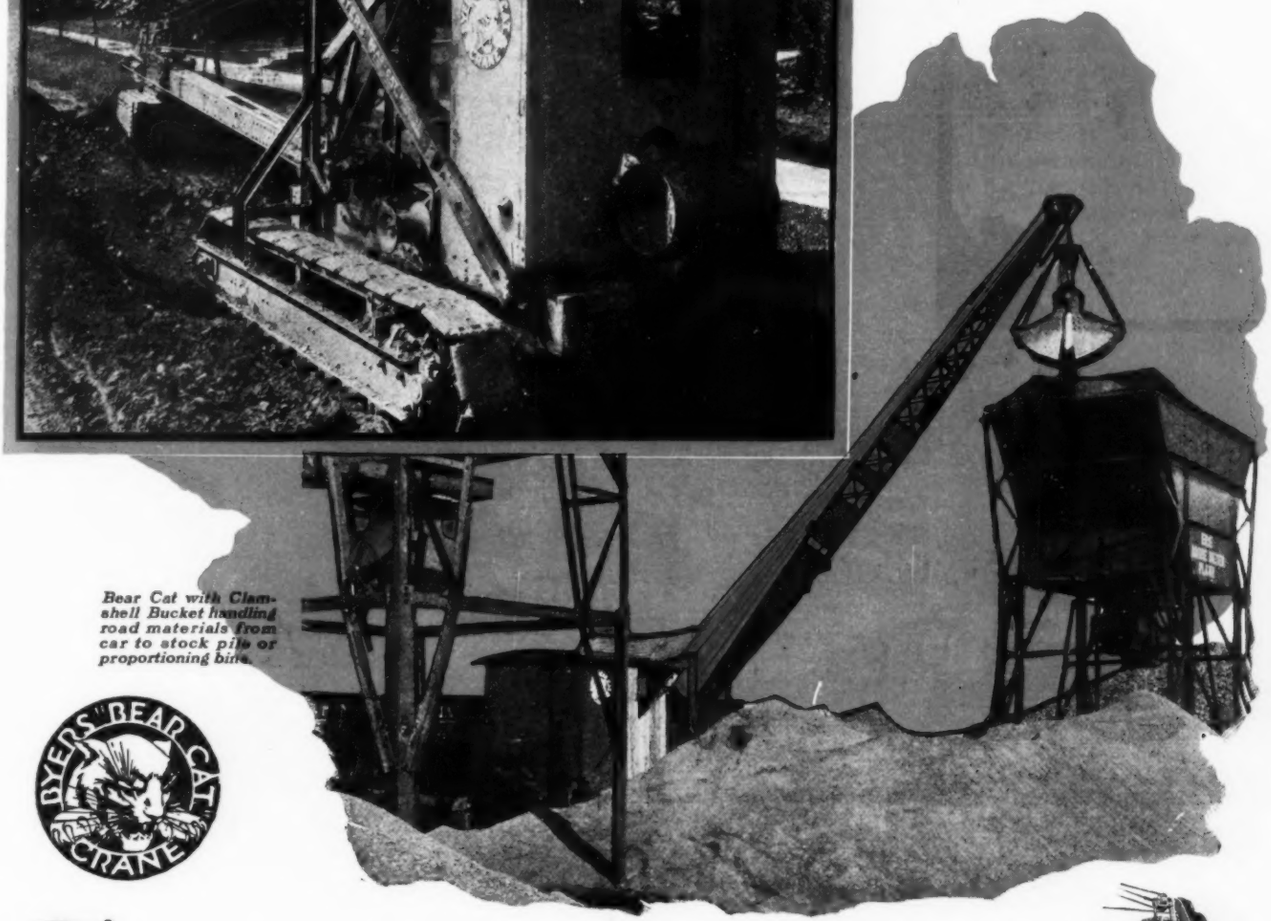


Bear Cat, with Skimmer Attachment, on city street grading.



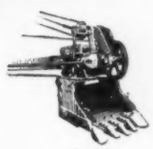
Bear Cat with Clamshell Bucket handling road materials from car to stock pile or proportioning bins.

BYERS "BEAR CAT" CRANE

There's just one reason

for the huge success of the Bear Cat. It pays the owner more per dollar invested.

CLAMSHELL



SKIMMER

SHOVEL

DITCHER

BACK FILLER

THE Bear Cat is a dependable, all-purpose machine, low in first cost, low in operating cost, low in repair cost.

Mounted on big full caterpillars for instant and maximum traction, it digs and handles materials with a speed that rivals much heavier and more expensive machines.

For four years now, Byers has concentrated on the Bear Cat, giving up all its other lines, and devoting all its resources and experience of over 40 years to build this one machine better and better.

The first public appearance of the new "Model 27" Bear Cat is the big Byers exhibit at the Chicago Road Show.

The new Bear Cat Catalog, will tell all about this machine, the greatest value we believe, ever offered to contractors. Send for it.

THE BYERS MACHINE COMPANY, Ravenna, Ohio

Builders also of Byers Truckrane

Sales and Service Throughout the Country

The Byers Machine Co., Ravenna, O.

Gentlemen:—

Send me a copy of the new Bear Cat Catalog. The kind of work I am particularly interested in is.....

.....

Name .....

Address .....

Town.....

State.....

S. M.—1-27

BYERS BEAR CAT

A 200 FOOT Insley Steel Mast Hoist Plant with a 40 foot boom and 40 foot counterweight plant being used by the H. W. Underhill Construction Company on the new Herring Hotel job at Amarillo, Texas.

This job is 125 feet by 140 feet—14 stories in height. The contractor is working three shifts.

TRADE MAST HOIST MARK

An Accomplishment

A 200 FOOT steel mast is no mean stick. To build such a mast with sufficient strength to carry a 21 cubic foot bucket, and 40 foot boom and 40 foot counterweight plant, requires not only skill at design but long experience, and to make it so that every piece fits every other piece exactly, so that every section is interchangeable, and so that they go together equally well either 20 feet or 180 feet from the ground requires real manufacturing skill.

Such ability of design and manufacturing exactness have made the Insley Mast Hoist the best concrete handling plant obtainable. If you have concrete to place, an investigation of this plant with a tip-over type bucket, and 40 foot boom and 40 foot counterweight chute, will be worth your while.

Send for our Catalogue 50

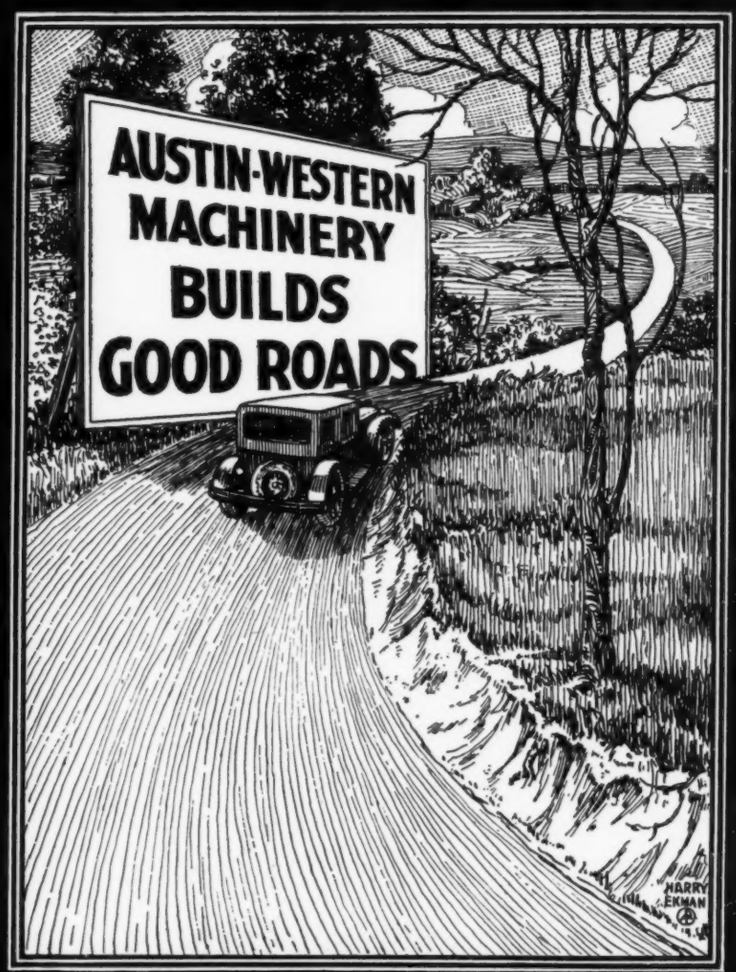
INSLEY MANUFACTURING COMPANY · INDIANAPOLIS

Engineers and Manufacturers

INSLEY Concrete Placing Equipment : Steel Derricks Buckets and Cars : Excavating Equipment

491

WHEREVER YOU GO



THE AUSTIN-WESTERN LINE

Screening Plants, Road Drags, Motor Rollers, Pup Rollers, Scarifiers, Culverts, Motor Graders, Sprinklers, Wheelers and Scrapers, Gyratory Crushers, Oilers, Street Excavators, Jaw Crushers, Dump Wagons, Portable Conveyors, Leaning Wheel Graders, Straight Wheel Graders, Steam Rollers, Sweepers, Elevating Graders, Plows

See these machines at the National Good Roads Show.

Chicago
Jan. 10-14

Recent years have witnessed remarkable progress in the science of road building — progress that has been made possible only through the use of new and improved machinery.

For more than half a century this Company has done its part in hastening this development by always providing machinery correctly designed to meet the latest requirements of road construction.

Tangible evidence that it is still doing so will be found in the new 1927 General Catalog. The coupon makes it easy for you to ask for your copy.

THE AUSTIN-WESTERN ROAD MACHINERY CO.

400 N. MICHIGAN AVENUE, CHICAGO, ILL., U. S. A.

BRANCHES IN ALL PRINCIPAL CITIES.

Please send me a copy of the new 1927 Austin Western General Catalog. 2

_____

_____

_____

CLYDE

Standard Hoists and Derricks
For the General Contractor

STEAM · ELECTRIC · GASOLINE · BELT

The J. E. Moss Iron Works, of Wheeling, W. Va., write enthusiastically about the two-drum, sixty horsepower gasoline hoist which they used on the Masonic Temple building in Cincinnati.

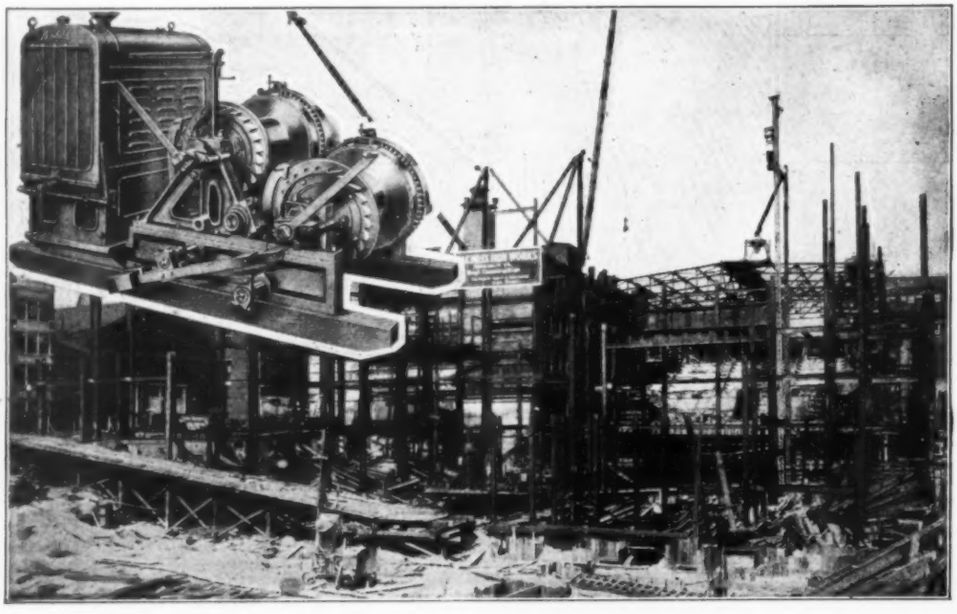
T. C. Jenkins, general superintendent, writes as follows: "We are very well pleased with the Clyde Gasoline Hoist we are using on the Masonic Temple job in Cincinnati. The men who are working with it say it is the best piece of equipment in the hoisting line they have ever used.

"As soon as we can sell our steam hoists, I intend to replace them with gasoline.

"Our Clyde hoist handles the 85-foot boom with 12-ton bucket with ease."

Frank J. Kristoff, superintendent in charge of the work adds: "I believe the success of this hoist is due to the acceleration feature you put on the engine, making it flexible and easy to control. This we have not found on any other hoist."

You'll Take Pride in Your Clyde!



CLYDE IRON WORKS SALES CO.

DISTRIBUTORS FOR CLYDE IRON WORKS DULUTH, MINNESOTA

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NEW YORK CITY:	856 EAST 136TH STREET
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CINCINNATI:	1913 UNION CENT. BUILDING
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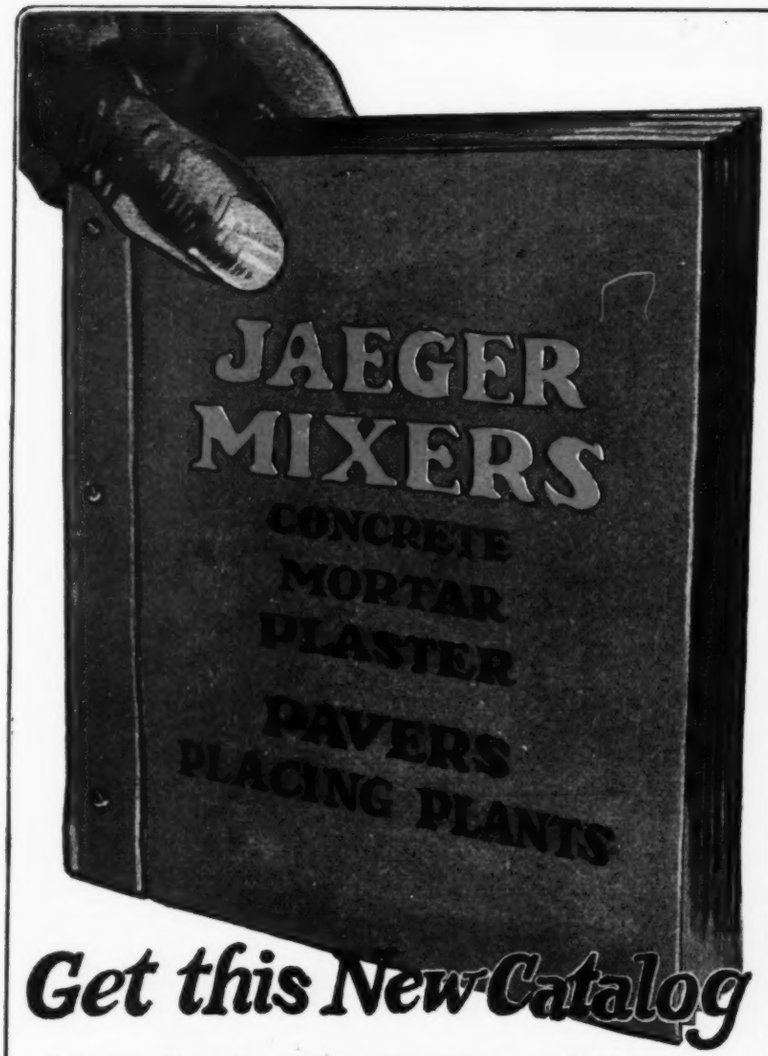
JACKSONVILLE FLA.:	43-45 W. FORSYTH ST.
SAN FRANCISCO:	739 MONADNOCK BLDG.

CLYDE TWO MARKS OF GUARANTEED QUALITY

SUCCESSFUL PERFORMANCE A.G.C.



Get this New Catalog

Jaeger offers for 1927 — Non-Tilters and Plaster Mixers, in addition to the latest types of Jaeger Tilters, "The Largest Selling Mixer in the World."

Automatic "Skip Shaker"

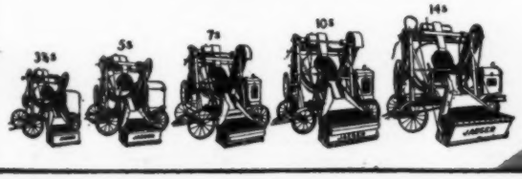
No more battering the bottom of loading skips or hoppers. This patented automatic attachment vibrates load out clean and fast. Another Jaeger success.

Other exclusive Jaeger features are patented "REMIXING ACTION" — REAL MEASURING "TIP OVER" WATER TANK — SEMI-AUTOMATIC DUMP BOWLS — STEEL CONSTRUCTION.

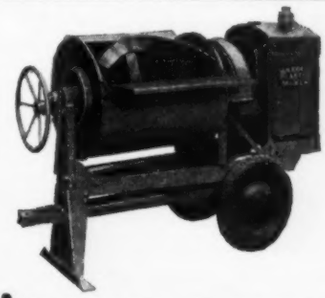
Jaegers Cost No More than Ordinary Mixers. Get Our New Prices and Convenient Terms.

THE JAEGER MACHINE COMPANY
800 DUBLIN AVE., COLUMBUS, O.
Branch Offices — Warehouses in All Principle Cities

There is a Jaeger for Every Size Job
5 Sizes — 36 Models — Pavers

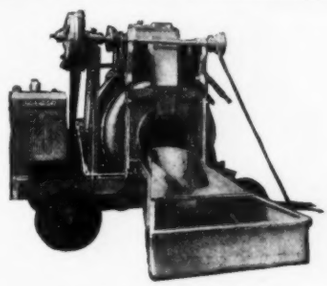


JAEGER *PLASTER MIXER*



SELF CLEANING HOE TYPE
Cuts Mortar-Plaster Mixing Costs in Half

JAEGER *NON-TILT MIXER*



TWO BAG CAPACITY
At One Bag Weight and Price

JAEGER *TILTING MIXER* OVER 45,000 IN USE

HIGH SPEED TRAILER
Built for Fast Hauls
Over Bad Roads
Springs — Roller Bearings — Cushion Tires

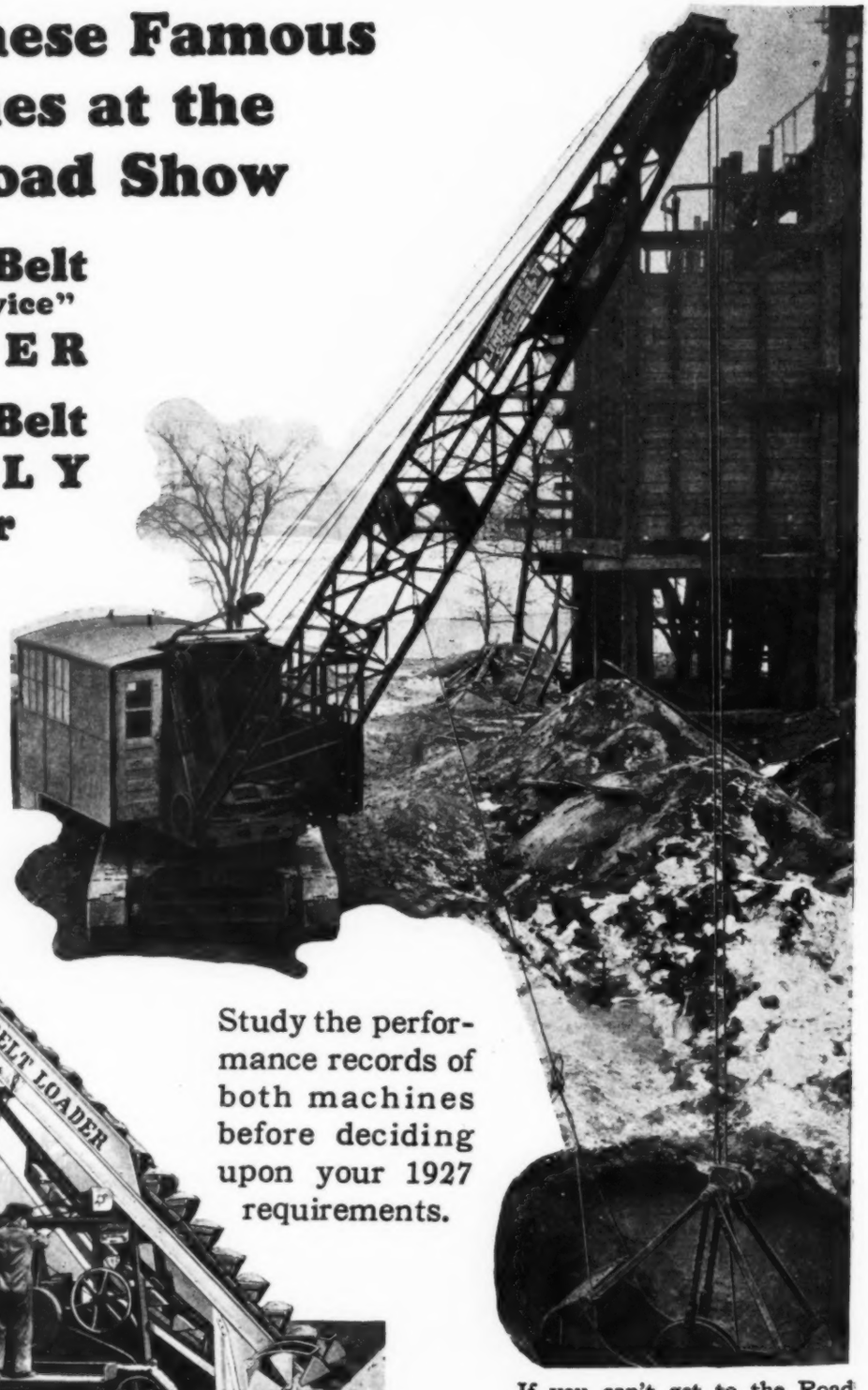
MAIL THIS SLIP TO-DAY FOR BIG CATALOG

JAEGER MACHINE CO. Ohio Date
800 Dublin Ave., Columbus,
Please send Catalog on Jaeger Mixers; also prices and terms on
Name
Address
City
State

Inspect These Famous Machines at the Good Road Show

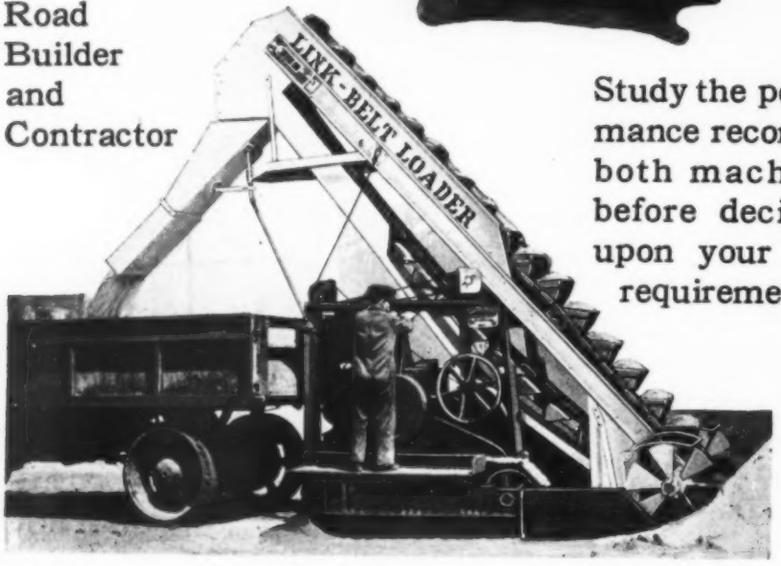
—The Link-Belt "Built for Service" CRAWLER

—The Link-Belt GRIZZLY Loader



Recovery, Batching, Loading

with Link-Belt Equipment means larger profit to Road Builder and Contractor



Study the performance records of both machines before deciding upon your 1927 requirements.

If you can't get to the Road Show— or even if you can, ask for our Catalogs No. 895 and No. 924.

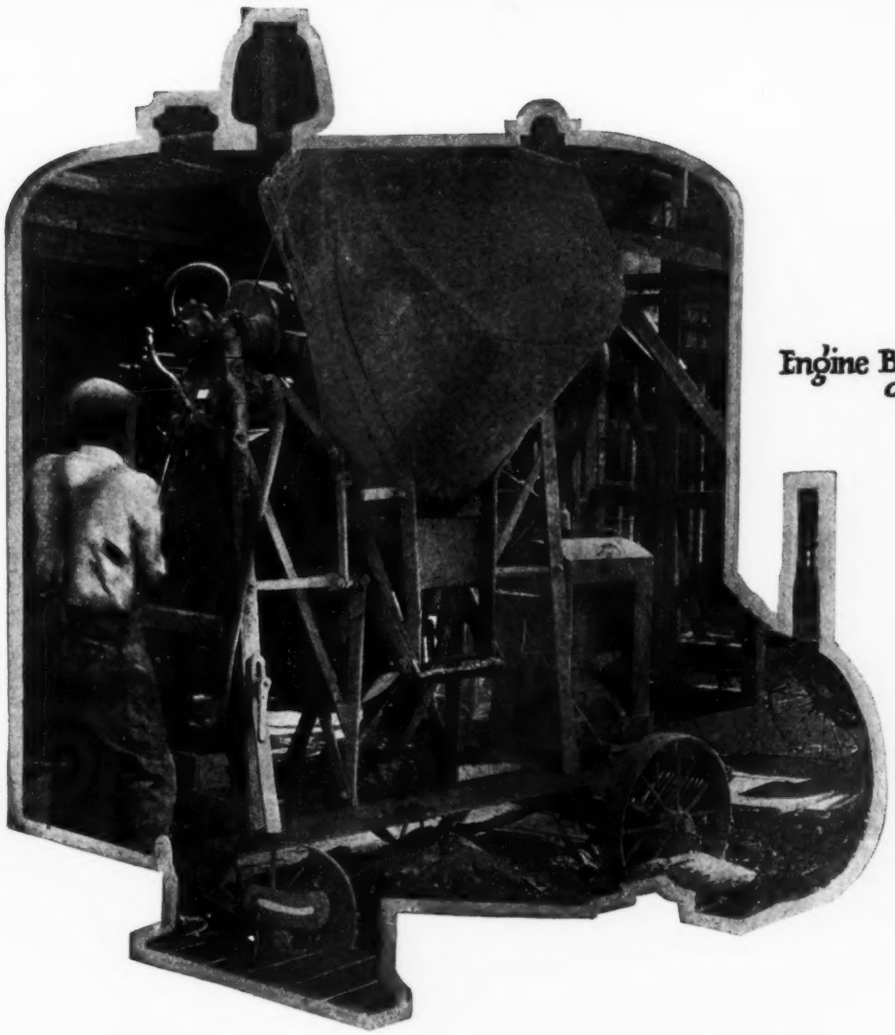
LINK-BELT COMPANY

2931

Leading manufacturers of Elevating, Conveying and Power Transmission Chains and Machinery

PHILADELPHIA, 2045 Hunting Park Ave. CHICAGO, 300 W. Pershing Road INDIANAPOLIS, 200 S. Belmont Ave.

LINK-BELT



Engine Builders *only!*

In the Shadow of Power!

IF power took form it would be gigantic. Its structure massive. For everywhere — on construction work, progress is measured by it. Buildings "grow" in its very shadow. But, of course, size is not indicative of service.

Le Roi Engines as well as being compact and sturdy are "power-full". Turning the drums of mixers or controlling cables of hoists—this dependable power gives "life" to equipment of manifold variety.

And to distinguish itself as a leader, it boasts of a record of unbelievable low maintenance cost. Le Roi's high and enviable position in its field is entirely due to unparalleled performance — in short, the lowest operating costs per day and per year.

See Le Roi's line of engines at the Good Road Show.

LE ROI COMPANY • MILWAUKEE

LE ROI ENGINES

for dependable power!

Covering Your Factory Floors with Thick Linoleum

Science has traced a good share of industrial fatigue to hard, unyielding floors. Every step taken on a hard floor is a shock to the nervous system and a jar to the body. Several hundred of these shocks and jars a day soon leave their mark upon your employees and upon their efficiency.

Covering your factory floors with thick Battleship Linoleum would lessen industrial fatigue—but how long would it last?

Our 1.2.3. Hydro-Proof (liquid asphalt) will make your floors as resilient and as easy to walk upon as thick Battleship Linoleum—at the same time give them a permanent, durable surface. It will leave them dustless, water, alkali, spark and acid proof.

Let your factory engineers and chemists test Hydro-Proof to prove its convenience, economy and efficiency. We'll gladly send the working samples, free of charge, and without placing you under any obligations.

The Asphalt Products Co.
704 Free Street, Syracuse, N. Y.

MAIL THIS COUPON

THE ASPHALT PRODUCTS CO.,
704 Free St., Syracuse, N. Y.

You may send me working samples of HYDRO-PROOF. I understand this is to be sent me free of charge and without placing me under any obligations.

Company .....

Individual .....

Address .....

Send for this—

Below—Cleveland CD3 Clay Digger enlarging trench for installation of fire hydrant.

Backfill Tamper
It rams ten times as fast as by hand, and does a better job.

Cleveland Paving Breakers are saving 50% of the cost and at least 75% of the time usually required in ripping up city pavement and hard roads. Making big savings also in breaking up frozen ground, cutting manholes, enlarging trenches, tearing down walls, etc.

Send for Bulletin shown above, describing Cleveland Paving Breakers and other Cleveland tools for the contractor—Cleveland Clay Diggers, Backfill Tampers, Calking and Chipping Tools. *Ask for Bulletin No. C6A.*

Cleveland Calking Tool in use on a water main.

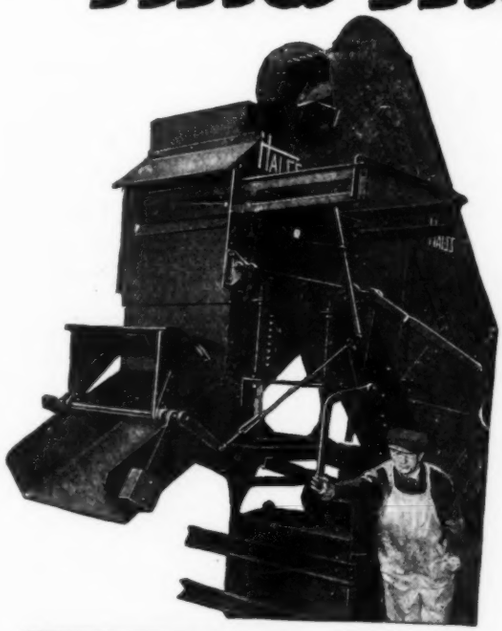
The Cleveland Rock Drill Co.
3734 East 78th Street, Cleveland, Ohio

Chicago, Ill., 608 S. Dearborn St.
Detroit, Mich., 428 Insurance Exchange Bldg.
New York City, 30 Church St.
St. Louis, Mo., 2091 Railway Exchange Bldg.
Philadelphia, Pa., The Bourse Bldg.
Birmingham, Ala., 403 N. 24th St., Box 2028.
Pittsburgh, Pa., 922 Farmers Bank Bldg.
Negaunee, Mich., 222 Heath St.
British Representative: John MacDonald & Company, Pollokshaws, Glasgow, Scotland.

CLEVELAND ROCK DRILLS

Grading First

And Then Batching



THE double-duty function of the Haiss Creeper Loader gives it first call on any paving contractor's preference. And because it has the power to wade into the heavy digging, it is the best machine for stockpile loading, too.

You can hold the grade with a Haiss Loader because the boom is rigidly pivoted to the chassis and is held at grade with the worm gear raising-and-lowering device. You can make a cut because the Haiss patented revolving paddles and slow-speed crowding drive, with a 37 H.P. Waukesha Engine back of them, stand right up to the job.

And the Haiss Precision Batch Hopper is the speediest and most easily operated thing of the kind, with micrometer accuracy and easy-acting strike-off.

Stop and get acquainted at Space NC-23, Chicago Road Show. Or write for Catalog 523 and Bulletin 126.

Manufacturer of
THE GEORGE
--Truck and-- Wagon Loaders
Portable Belt Conveyors

HAISS

139th Street and Rider Avenue, New York

Representatives Throughout the World.
Millars Timber & Trading Co., London, British Representative.
Cable Address "Coalhoist" New York—"Western Union 5 Letter Edition" Code.

Established 1892
MFG. CO. INC
Clam Shell --Buckets--
Mat'l Handling Equipment.

WATSON-STILLMAN
INDEPENDENT PUMP HYDRAULIC JACKS

are being used extensively by Underpinning and Foundation Contractors for underpinning work, sinking piles under foundations and making tests of footings.

These jacks are accurate, dependable and easy to repair.

The pump, being independent, can be operated at a safe distance from the load and in a convenient position. For forcing and pressing work, it can be used in connection with your own framework. For extra heavy work, several jacks may be used with one pump or from an accumulator.

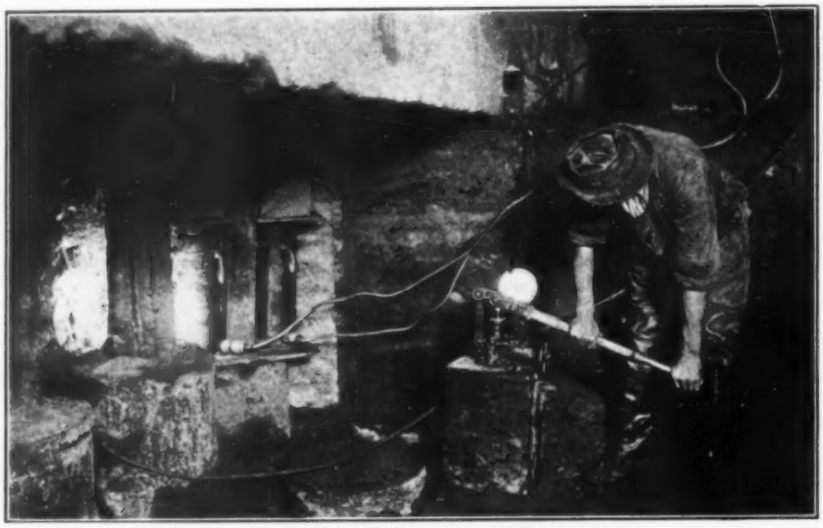


Photo by courtesy of Spencer-White and Prentis.

We make a full line of other types of jacks, and also many hydraulic devices suitable to the contractor's needs, such as benders, shears, pumps, punches, valves, etc.

Write for catalogs.

The Watson-Stillman Co.
1014 Evening Post Bldg.
New York City

Chicago, 549 W. Washington Blvd.
Philadelphia, Widener Bldg.
Cleveland, Auditorium Garage Bldg.
Detroit, 7752 Duboise St.

—When in New York—

Do Not Fail To Visit The FORD POWER EQUIPMENT EXPOSITION

The Greatest and Only Permanent Exhibition Of Its Kind. Over Eighty Of the Country's Leading Manufacturers of Industrial, Agricultural and Commercial Attachments for the Fordson Tractor and Ford Chassis Have Exhibits On Display. Centrally Located. Do Not Miss It.

At the Good Roads Show in Chicago the predominance of Ford Power for construction equipment is everywhere in evidence. At the permanent Ford Power Equipment Exposition in New York is a complete display of every thing for every type of work. It is "headquarters" for the contractor who is seeking flexible and economical equipment.

If unable to visit us in person, send for literature and prices on the equipment in which you are interested.

Descriptive Circular Furnished Gratis On Any of the Above Equipment.

The following are a few of the groups of equipment that can be seen on display:

GRADERS
SNOW PLOWS
LOCOMOTIVES
LAWN MOWERS
DUMP TRAILERS
TANK BODIES
DUMP BODIES
ROAD ROLLERS
STREET SWEEPERS
BACKFILLERS
CONCRETE MIXERS
CATERPILLARS
STUMP PULLERS
LOG SKIDDERS
SCOOPS AND SCRAPERS
TRACTOR TRAILERS
INDUSTRIAL SHOP TRAILERS
AGRICULTURAL IMPLEMENTS
MARINE ATTACHMENTS
AIR COMPRESSORS
COMMERCIAL BODIES
CRANES
HOISTS
PUMPS
LOADERS
SHOVELS
WOOD SAWS
SAW MILLS

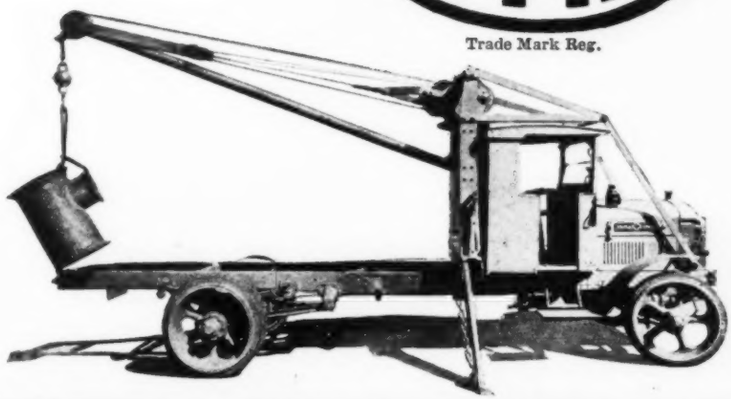
Ford

POWER EQUIPMENT EXPOSITION

Ford Motor Building **54th Street and Broadway, New York**

ATIA

Trade Mark Reg.



SPECIFICATIONS:

Weight, 2500 to 3000 lbs., according to attachments; lifting capacity, 3000 lbs.; column height, 10 ft. 4 ins. Length of boom, 12 ft. extended to 15 ft. Swing of boom, 160°, radius of 15 ft. Space taken back of cab, 9 inches. Lift capacity, 45 feet a minute. Equipped with 35 ft. of cable, two outriggers to stabilize truck, one niggerhead on left side; two drums, one for raising load, one for elevating boom. Boom on this type operated in all directions by power from motor.

AUTO TRUCK DERRICK

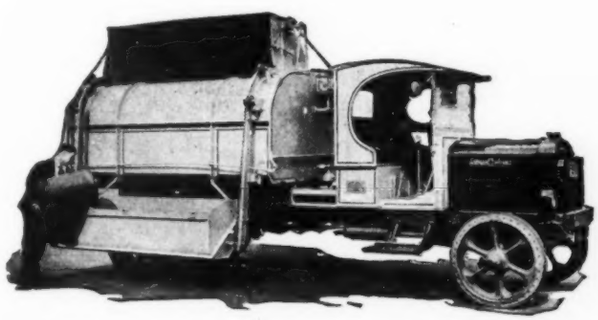
—add it to your truck and

HOIST - LOAD - DIG

Converts your truck into a TIME and LABOR saver.

With HOOK or CHAINS lifts pipes, girders and other solid objects. With LAZY TONGS handles barrels, bales, boxes, crates, etc. With CLAM SHELL or ORANGE PEEL bucket, loads stone, gravel, sand, coal and other soft or loose material.

ONE OPERATOR on truck has absolute control over load and placement.



Can be knocked down, packed compactly, shipped anywhere. Can be set up ready for immediate use at any machine shop or garage having proper facilities.

Sheaves bushed with self-oiling bearings. Interior gears and reverse mechanism of chrome nickel steel with hardened and ground dental clutches running on ball bearings in enclosed grease-filled gear boxes. Gear units easily removed for inspection or replacement. Large factor of safety over specified capacity. Protection from overload breakage insured by patented slipping clutch set to lift slightly in excess of rated capacity.

Any unskilled workman can operate. Will also do work of vertical hoists for raising and lowering body. Can be used for catch basin cleaning and sewer operation with orange peel buckets.

Derrick can also be furnished for raising and lowering load, boom to be slewed by hand, by aid of niggerhead. Prices and fuller details will be sent on request. Certain territory still available for first class distributors. Correspondence invited.

ATIA CORPORATION, 150 Broadway, New York, U.S.A.

Also ATIA Ash and Garbage Removal Bodies

LIDGERWOOD

Extends

The SEASON'S GREETINGS

To All

LIDGERWOOD MANUFACTURING COMPANY

96 Liberty Street New York, N. Y.

C.H.&E.

Saw Rigs
Pumps
Hoists
Mortar
Mixers
Elevators

Here's the New

C. H. & E. LIFT AND FORCE PUMP

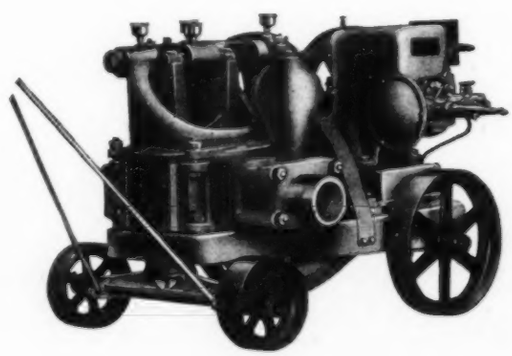
that will handle muddy, gritty water, same as a Diaphragm Pump only that it will lift 20 ft. and force 20 ft., or a total head of 40 ft.

Has a capacity of 6,000 gallons per hour and carries a 2 H.P. Fuller & Johnson engine.

The rubber diaphragm can be easily replaced by lifting four bolts.

Our representatives carry these pumps in stock for immediate shipment to your job.

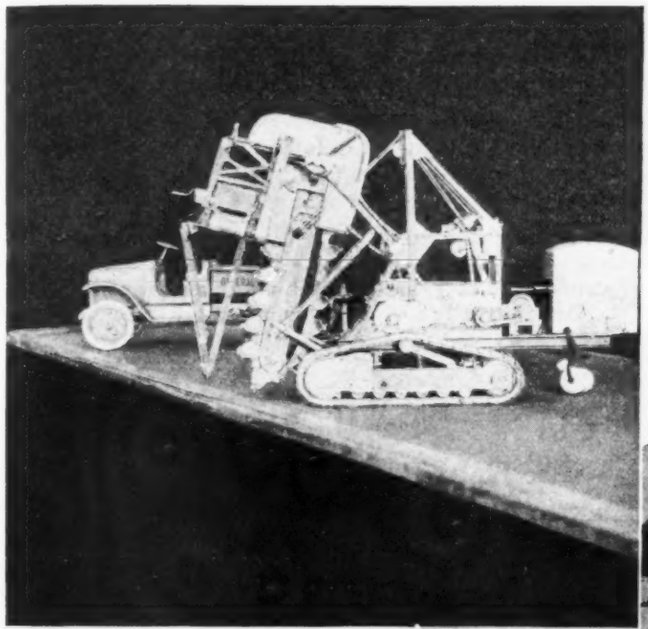
Also manufacture saw rigs, diaphragm and centrifugal pumps, hoists, mortar mixers and material elevators.



Write for Catalogue.

C. H. & E. MANUFACTURING CO., Inc.
510 Mineral St., MILWAUKEE, WIS.

Let These B-G Juniors Show You How Barber-Greenes Earn Profits

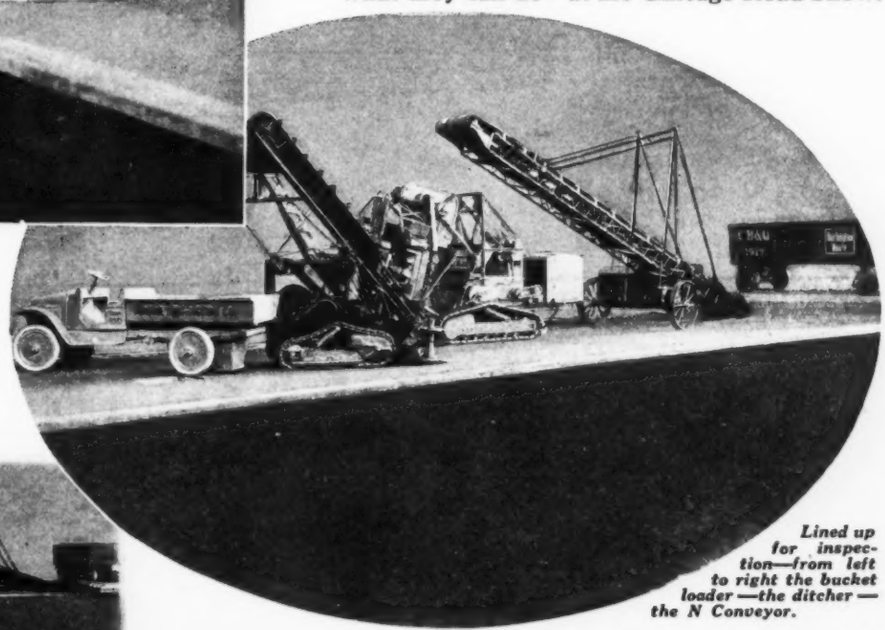


Here's The B-G Junior Ditcher—modeled closely after the famous "Ditcher that Couldn't be Built."

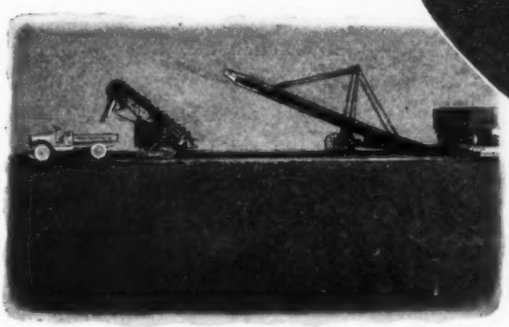
At the Road Show
Booth No. 47

PERHAPS you've never seen the Barber-Greene Ditcher digging yard after yard of clean-cut trench—the Barber-Greene Loader sailing straight into a stock pile or embankment—or the Barber-Greene "N" Conveyor unloading loose material direct from a hopper-bottomed car.

If not, you will have a good chance to see what they can do—at the Chicago Road Show.



Lined up for inspection—from left to right the bucket loader—the ditcher—the N Conveyor.



From car to storage to truck—B-G Juniors will demonstrate this job at the Road Show.

Three Barber-Greene Juniors—perfect miniature working models of the Bucket Loader, the Ditcher, and the Portable N-Conveyor, will be on the job. And they'll be proud to show you just how Barber-Greenes earn profits on every job they tackle.

See them any time between January 10th and 14th—at Booth No. 47 at the Road Show.

BARBER-GREENE COMPANY—*Representatives* *in 50 cities*—**530 West Park Avenue, Aurora, Ill.**

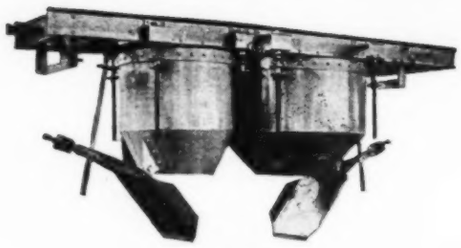
BARBER B G **GREENE**

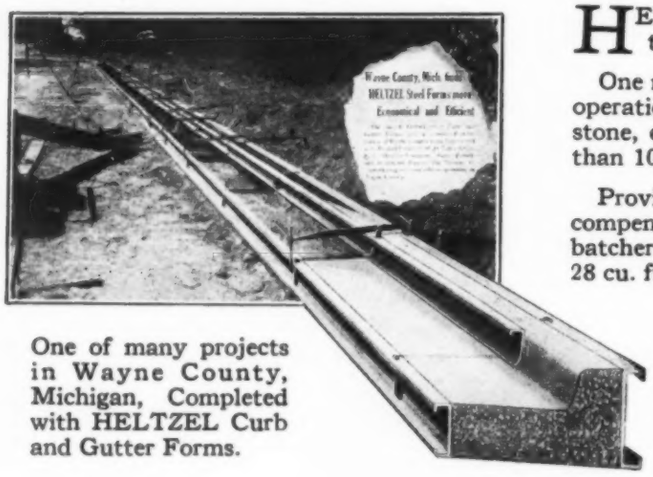
BELT CONVEYORS — **CAR UNLOADERS—COAL LOADERS**

Disc Feed Loaders — *Vertical Boom Ditchers*

Permanent Conveyors

Heltzel Armor Plate Steel Road Forms are built so much heavier and stronger and they set so much more rigidly they are preferred for important road paving projects.





One of many projects in Wayne County, Michigan, Completed with HELTZEL Curb and Gutter Forms.

HELTZEL "one man" BATCHERS are without an exception the speediest and most efficient built today.

One man by operating a single lever, performs the complete operation of filling, cutting off, dumping the batch of sand and stone, closing the lower and opening the upper gates in less than 10 seconds.

Provisions are made for quick and accurate adjustment to compensate for bulking due to moisture content. Sand batcher capacity, 8 to 14 cu. ft., stone batcher capacity, 13 to 28 cu. ft. Loading indicators show when full or empty.

For use with wood or steel bins.

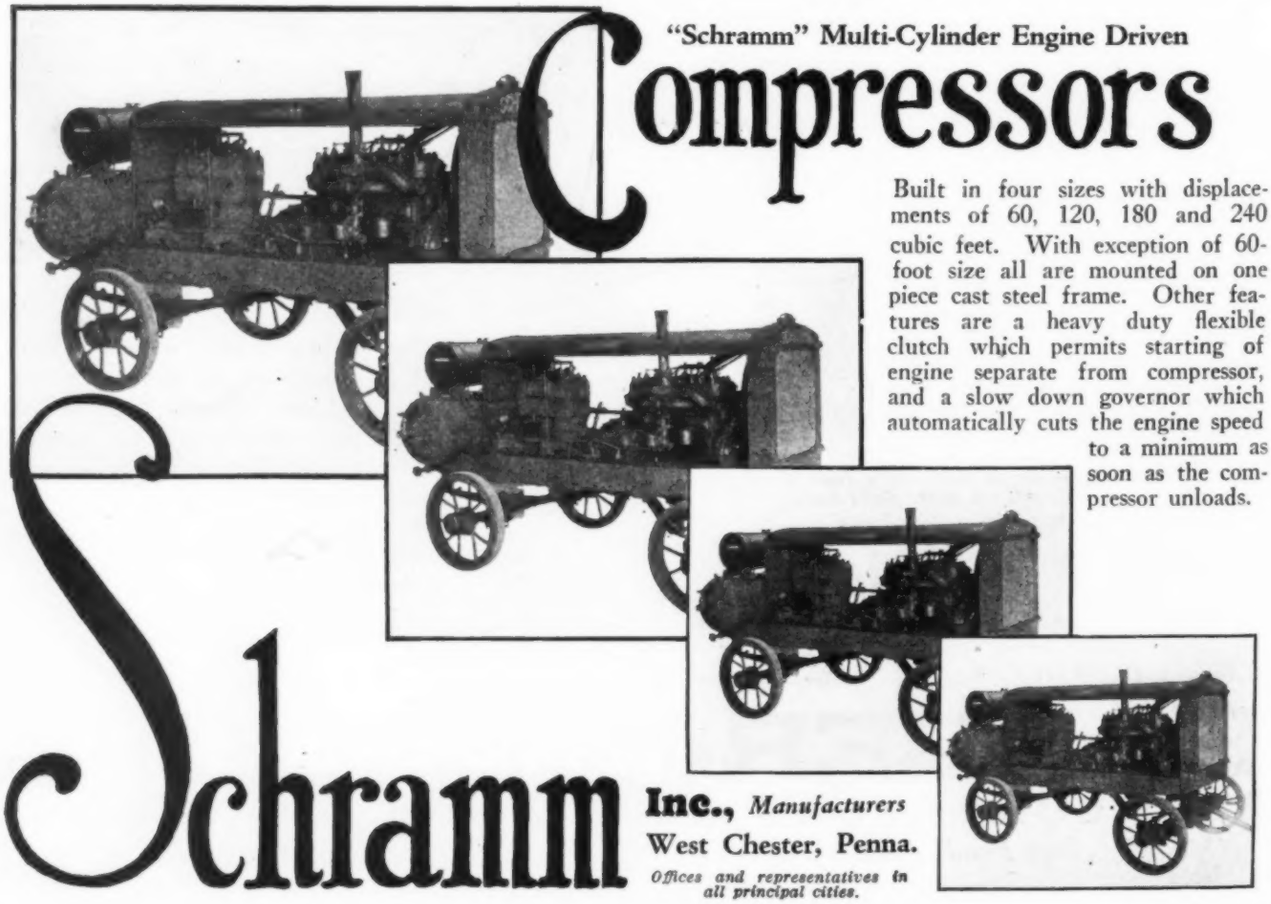
Meet us at the Chicago Road Show
Booth 55, Main Coliseum

The Heltzel Steel Form & Iron Company
WARREN, OHIO

HELTZEL

"Schramm" Multi-Cylinder Engine Driven

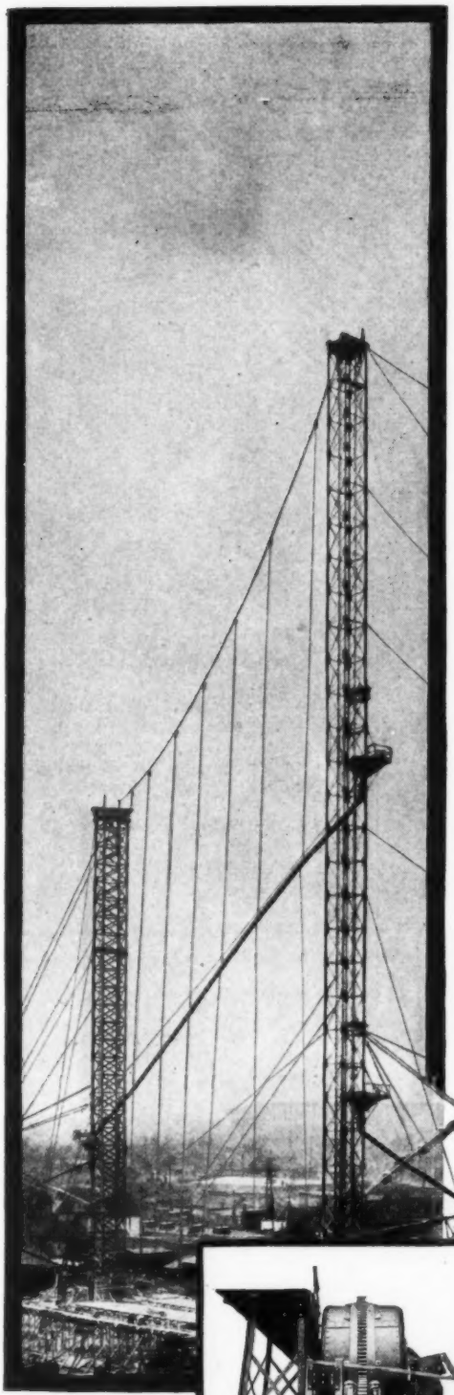
Compressors

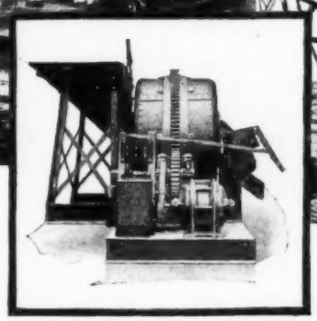


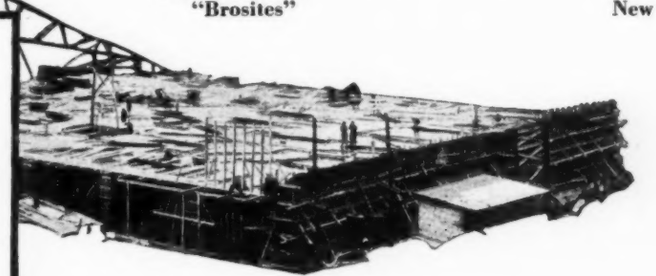
Built in four sizes with displacements of 60, 120, 180 and 240 cubic feet. With exception of 60-foot size all are mounted on one piece cast steel frame. Other features are a heavy duty flexible clutch which permits starting of engine separate from compressor, and a slow down governor which automatically cuts the engine speed to a minimum as soon as the compressor unloads.

Schramm

Inc., *Manufacturers*
West Chester, Penna.
Offices and representatives in all principal cities.







A 225-foot Lakewood Steel Tower and Auxiliary chuting equipment with one-yard mixer used by The William N. Miller Co. at Detroit.

Getting It Done

Faster

With Lakewood greater capacity chute with its longer life.

With Less Expense

On account of standardized and interchangeable tower and chute parts which cut erection costs.

Better

Because workmen do better work with better equipment.

With Less Worry

For the ruggedness of Lakewood products eliminates the chances of breakdowns.

THE LAKEWOOD ENGINEERING CO.

CLEVELAND, OHIO.

Cable address: "Brosites"

Export office: 30 Church Street New York City

LAKEWOOD

Paving and Construction Equipment

HERE'S THE HUMDINGER "40"

with

ball valves

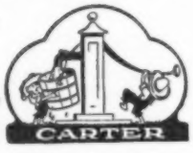
with four-inch suction and discharge—will handle 6,500 to 8,500 gallons per hour, lifting a total of 50 feet! Man, we don't need blue sky talk for Humdingers, whether we write about our closed-discharge or open-discharge models. The BALL VALVES alone on these diaphragm force pumps put them in a class by themselves.

Visit our Booth, E-20, at the Road Show

HUMDINGER BULLETINS

Diaphragm Force Pumps *Bulletin 103*

Open Discharge Diaphragm Pumps *Bulletin No. 104*



Power Force Pumps *Bulletin 105*

Centrifugal Pumps *Bulletin 107*

Write for them.

RALPH B. CARTER CO.
NEW YORK, N. Y.—HACKENSACK, N. J.

Four HUMDINGER features

1. Rubber ball valves that eliminate clogging, seat tighter allowing *maximum capacity* and greater suction lifts.
2. Closed, threaded outlets allowing pumps to discharge thru hose under pressure. No more troughs to build.
3. Driving jack totally *enclosed* and running in a bath of oil. Longer wear, less attention.
4. All steel truck with wrought steel wheels.

See

HUMPHRYES

DOUBLE FOUR

Lift and Force Trench Pump at the Road Show

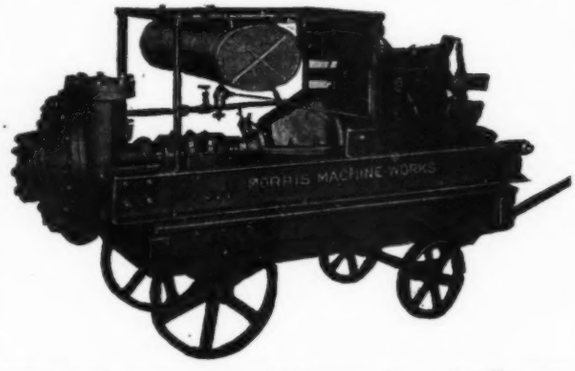
Be sure to visit Booth NB 9

If you are not going to the Road Show write for descriptive literature on this new pump.

Humphryes offer a complete line of portable drainage pumping equipment. When you strike water on a job remember that there is a Humphryes pump that will solve your problem.

The Humphryes Manufacturing Co.
Mansfield, Ohio
Distributors in principal cities

To make your unwatering and water supply problems easier!



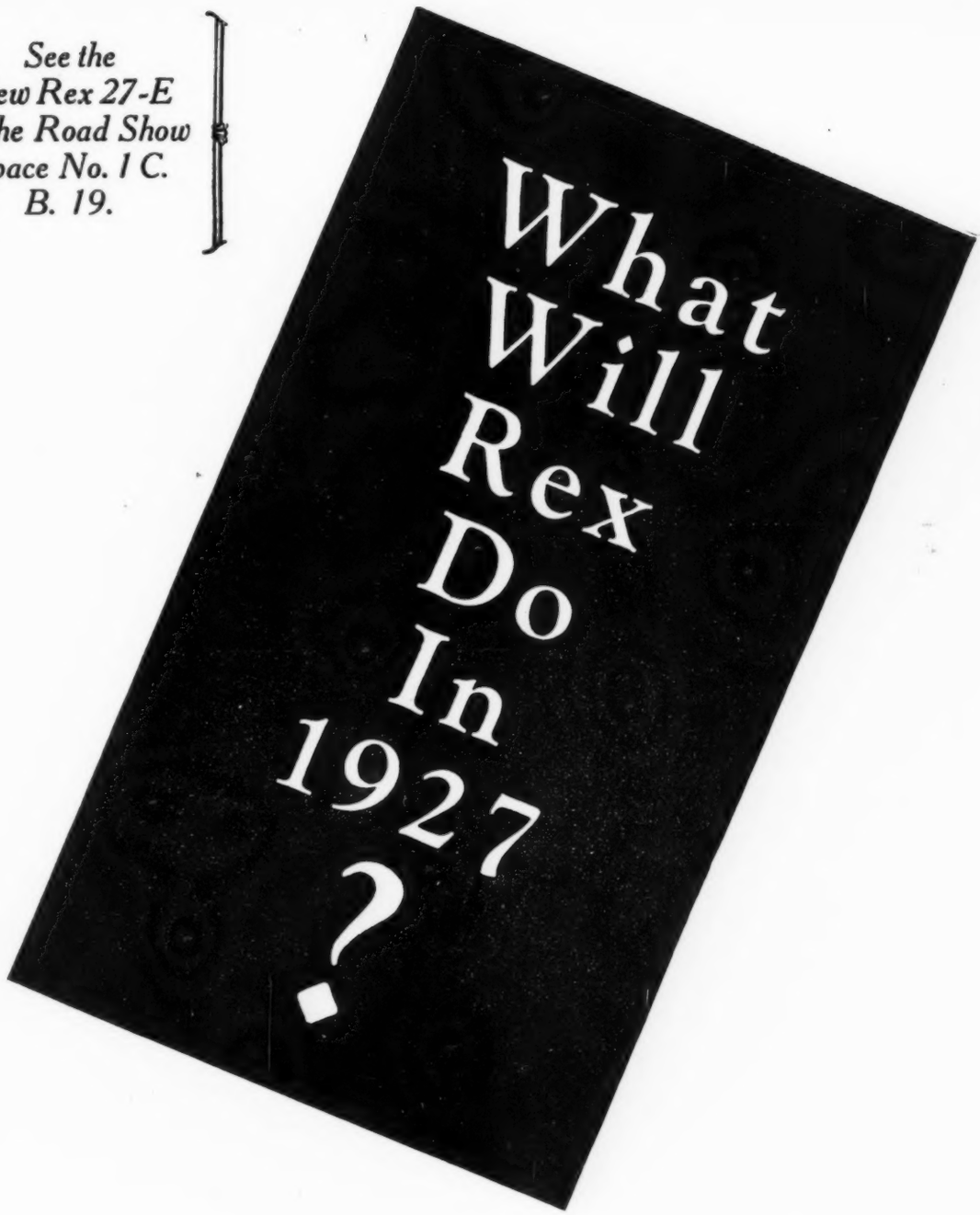
THIS Morris Portable All-Purpose Pump handles anything from clear water to floating dirt, sand and gravel, delivers 300 to 600 gals. per min., can be used for heads up to 50 ft., and is easy to cart from one job to another. For general water supply, unwatering excavations, sumps, etc., it can't be beat.

Write for literature about this and other sizes of Morris Pumps

MORRIS MACHINE WORKS, Baldwinsville, N. Y.

MORRIS
CENTRIFUGAL PUMPS

See the New Rex 27-E at the Road Show Space No. 1 C. B. 19.



BE SURE to see the New Rex 27-E at the Road Show. It's new, faster than any other Mixer,—with new features contributing ease of operation and long life.

Be Sure To See The New Rex 27-E.

CHAIN BELT CO., 764 Park Street, Milwaukee, Wis.

REX PAVERS

MORE YARDS PER DAY

LOXO
instruments
for every use!

Improved Loxo

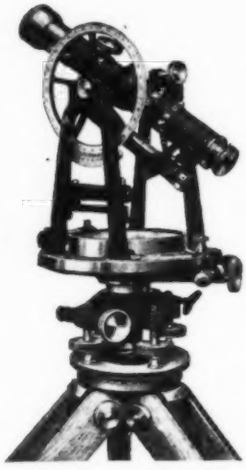
Farm or Carpenter's Leveling Outfit

From the simple Farm Level—to the all inclusive Transit

The Largest Line of Light Surveying Instruments Manufactured

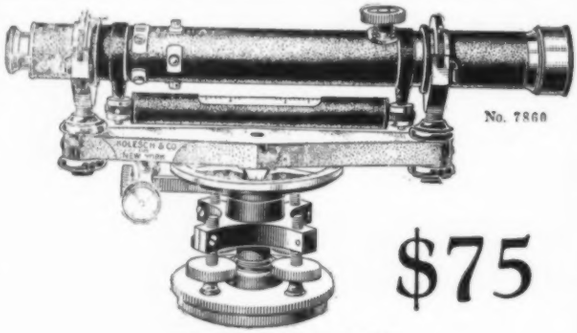
Send for Catalogue

Builders' Wye Level



Preliminary Transit

B. L. MAKEPEACE, INC.
387 Washington Street
Boston, Massachusetts



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$75

KOLESCH ARCHITECTS LEVEL

12-in. Telescope with clear definition. 20 diameters magnifying power. Constructed and built on lines of an Engineer's Y Level and will hold its adjustment longer than any other instrument of its kind.

Our catalogue describes this and other instruments in detail.

The "Protractor" keeps you up to date on the latest instrument improvements. Let us put your name on our mailing list.

KOLESCH & CO.
138 Fulton Street,
New York City

KOLESCH & CO., 138 Fulton St., New York City.
Kindly send me a copy of your Catalog, and put my name down gratis, for future copies.

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Company .....
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Tarpaulins
All Sizes
Large Stock Always on Hand

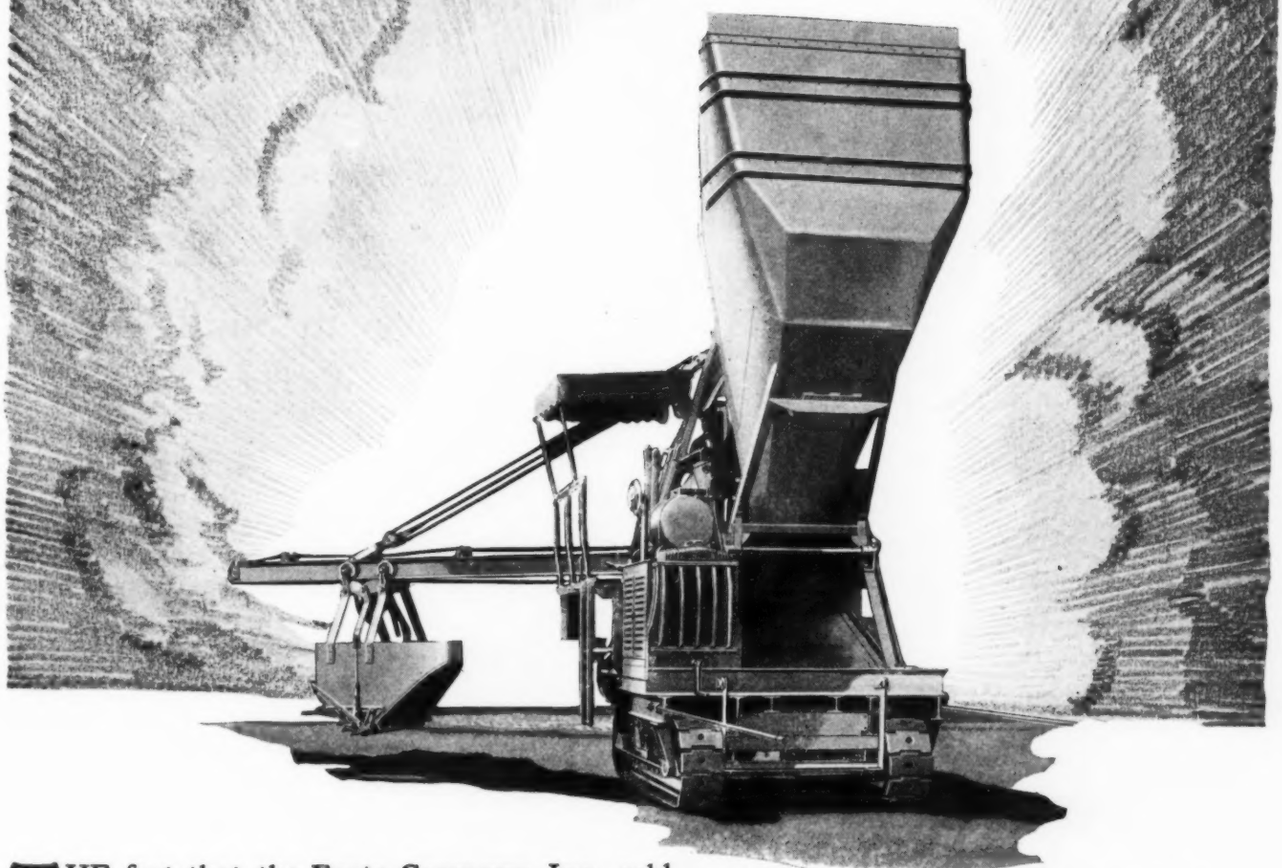
IF it's of CANVAS
"We make it!"

Truck Covers
and Rope Slings
Tents
and all kinds of Canvas Products
Sand Blast Equipment, Etc.

Get our prices before buying elsewhere.

KUNKELY OF NEW YORK
155 Chambers St., New York

A Multifoote 27E year



THE fact that the Foote Company, Inc., sold more 27E pavers than any other manufacturer in 1926 proves conclusively that the MultiFoote, Timken equipped 27E is endorsed by the contractors of the Nation. Every Timken bearing in the MultiFoote is guaranteed for life.

The Foote Company, Inc.
of Nunda, New York
The world's largest exclusive builders of road pavers

Frank Hall, 152 West 42nd Street, New York City. Wilcox Brothers, Inc., 588 Chenango St., Binghamton, N. Y. E. J. McHarg & Company, 31 Crestmont Road, Binghamton, N. Y. MultiFoote Sales Co., 2811 Fulton St., Chicago, Ill. Burton Franklin, Volunteer Bldg., Chattanooga, Tenn. Edward R. Bacon Co., 17 at Folsom St., San Francisco, Calif.

MULTIFOOTE
The Paver with Timken Bearings

8M1Gray

PULLMCO

THE ONLY PULLER

Having all features a puller should have

A PORTABLE POWER PLANT

For Road, Sewer, Deck, Bridge and other construction, Car Spotting, Wrecking, House Moving, Land Clearing and Material Handling.

Anchors by hook or cable. Works in any position.

Simple as a Lifting Jack

SPEED	PER MIN.	DRAW BAR PULL	
1st	3½ Ft.	9 to 12 Tons	WITH LEVERS
2nd	6½ Ft.	2 to 9 Tons	
3rd	11 Ft.	1 to 2 Tons	
4th	33 Ft.	0 to 1 Ton	
5th	65 Ft.	Ratio 6¼ to 1	WITH CRANKS
6th	85 Ft.	Ratio 3½ to 1	

Pull Can Be Increased to 100 Tons With 4 Tackle Blocks

The Puller that will do the job in the shortest time.

WHY? It can be pulled from place to place like a cart. Speed can be changed instantly to suit load. Brake (capacity 1,000 lbs.) can be used to slacken cable.

SPEED COUNTS

Sewer Construction

Pulling Mixer Over Soft Ground

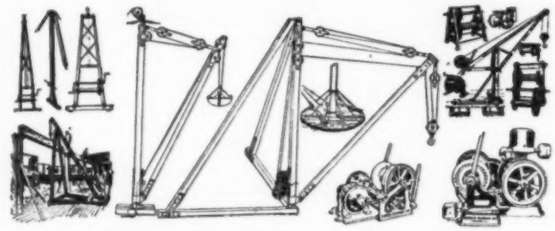
Car Spotting

WRITE FOR "POINTS ABOUT PULLERS."

Describe Your Problem. It Will Help Us to Help You.

PULLER MANUFACTURING CO.

600 West 57th St., New York, N. Y.



Derricks— Hoists— Winches—

The name Sasgen has been identified for many years with large and small building construction.

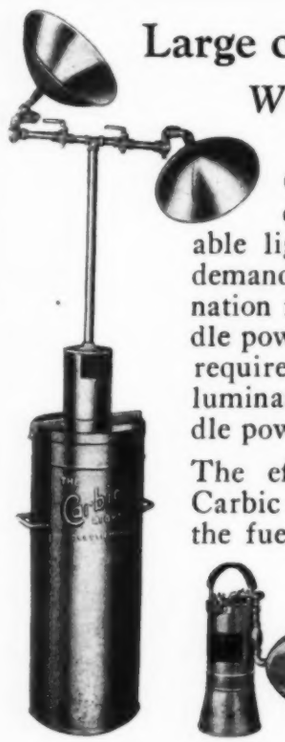
All sizes up to 10 Ton

Send for Circular S

Sasgen Derrick Co.

3101 W. Grand Ave.
Chicago

New York:
130 W. 42nd St.



Large or Small—

We Have Them All

Carbic supplies the demand for all portable lighting, whether that demand be for large illumination requiring 16,000 candle power lights or for other requirements of lesser illumination down to 600 candle power.

The efficient operation of Carbic lights is credited to the fuel: Carbic Cakes.

WRITE FOR CATALOG

CARBIC MANUFACTURING CO.

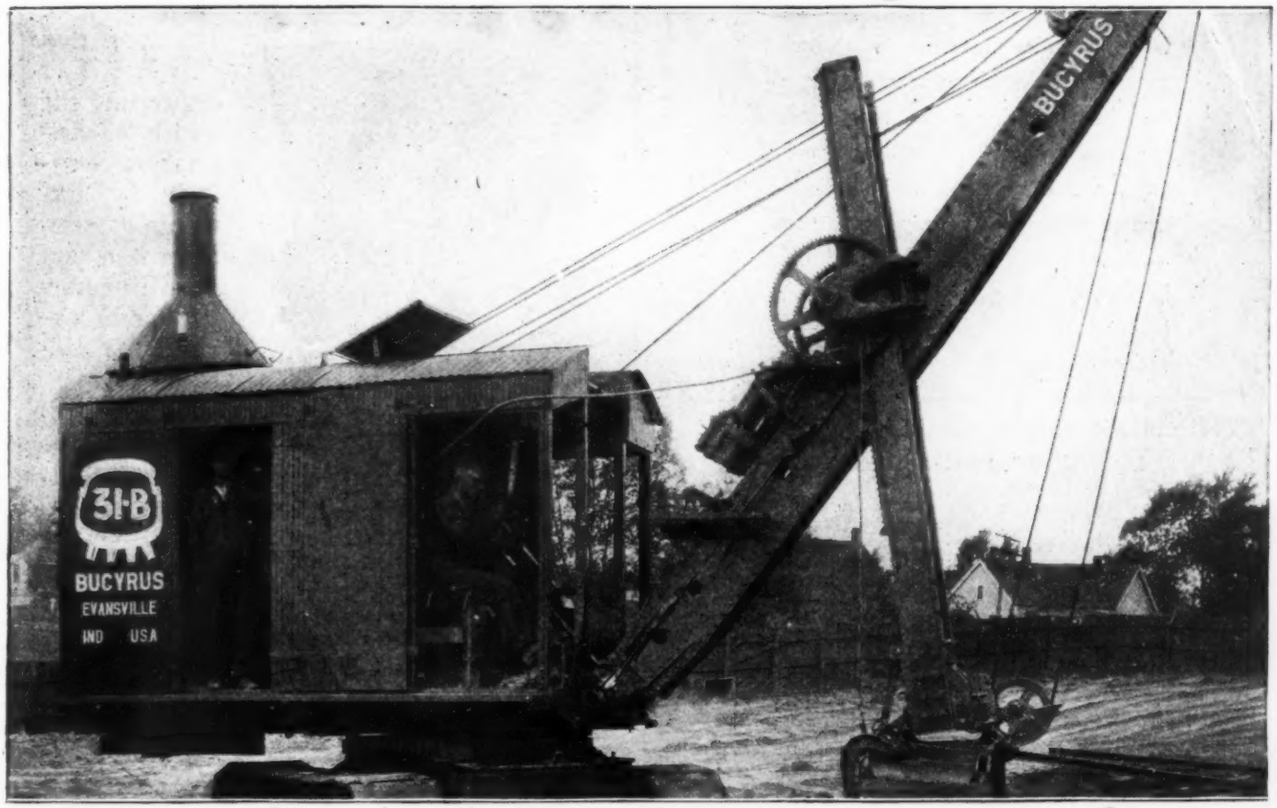
NEW YORK — DULUTH, MINN. — CHICAGO

GENERAL OFFICE

CARBIC PRODUCTS STOCKED IN OVER 75 CITIES

Bucyrus Headquarters at the Road Show, New Coliseum Balcony, Booth No. 75.

The new 31-B *does* dig faster



Swings faster—hoists faster—operates faster

The high-speed digging cycle of this 1-yard Bucyrus gives you more dipperfuls per hour—greater daily yardages at lower cost per yard.

On one basement job the new 31-B loaded as high as 42 trucks per hour, *and excavated 900 yards in 7 hours.* The light, sturdy, Bucyrus box girder boom and the corresponding lighter counterweight reduces the fly-wheel action. As a result the 31-B swings the loaded dipper faster.

And the famous Bucyrus outside dipper handles thrust the dipper squarely into the bank for a heaped measure at every pass. A two part hoist lifts the loaded 1-yard dipper faster.

31-B
41-B 50-B
Convertible To
DRAGLINE or CRANE

If you're going to buy a convertible 1-yard shovel, check the things you want and compare them with what the New Bucyrus 31-B can give you. The New C-311-2 Bulletin has the information. Write for it today.

BUCYRUS COMPANY, South Milwaukee, Wisconsin

BUCYRUS

NEW YORK CHICAGO BIRMINGHAM SAN FRANCISCO PITTSBURGH TOKYO LONDON

768

NEW

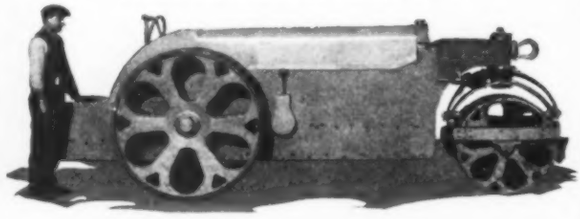
A LITTLE BROTHER TO THE

BIG HUBER ROLLER

Not a roller attachment thrown around a light, cheap tractor, but a real hard-working roller built from the ground up as a roller with Standard Roller Controls. This latest addition to the Huber Family now makes available 4 sizes—5, 7, 10 and 12 tons in the 4 Cylinder, enclosed gear, roller bearing Huber Rollers. Send for full particulars.

THE HUBER MANUFACTURING CO.

310 E. CENTER ST., MARION, O.



To Fill Any Form

The Stuebner Controllable Concrete Bucket with its patented device for regulating the width of discharge opening is extremely useful when you are filling narrow or inconveniently located forms.

It is a genuine time saving piece of equipment which pays for itself by stopping the waste of material. Write for information.

Turn-over and Bottom Dumping Buckets, Flat Cars, Push Carts, Steel Skips, End and Bottom Discharge Cars.

G. L. Stuebner Iron Works

Incorporated

Vernon Blvd., Long Island City, New York

Clip This "Ad"—

It May Show You How To Lower Excavating Costs

This new booklet contains a wealth of ideas for the man who wishes to improve his methods of handling excavating work. It tells in detail how the Sauerman Slackline Cableway digs, conveys and elevates, and is operated by one man. It is full of diagrams and pictures showing how other users have lowered their excavating costs. All it will cost you is the 2c. stamp on your envelope. Just clip this "ad"—sign your name and address—and send it to us.

Name.....

Address.....

City and State.....

SAUERMAN BROS., INC.

480 So. Clinton St., Chicago

UNIVERSAL

all-steel crushers

For crushing boulders, limestone, granite, gravel or any other form of rock no matter how hard or soft, UNIVERSAL ALL STEEL CRUSHERS will give you service that will satisfy.

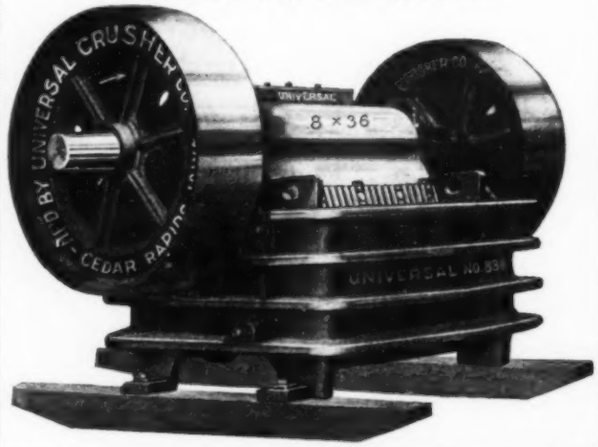
Universal Crushers include the most complete line—22 sizes—in the United States, and they embody over twenty years' experience in the design, building and use of crushers. Daily capacities to 450 tons.

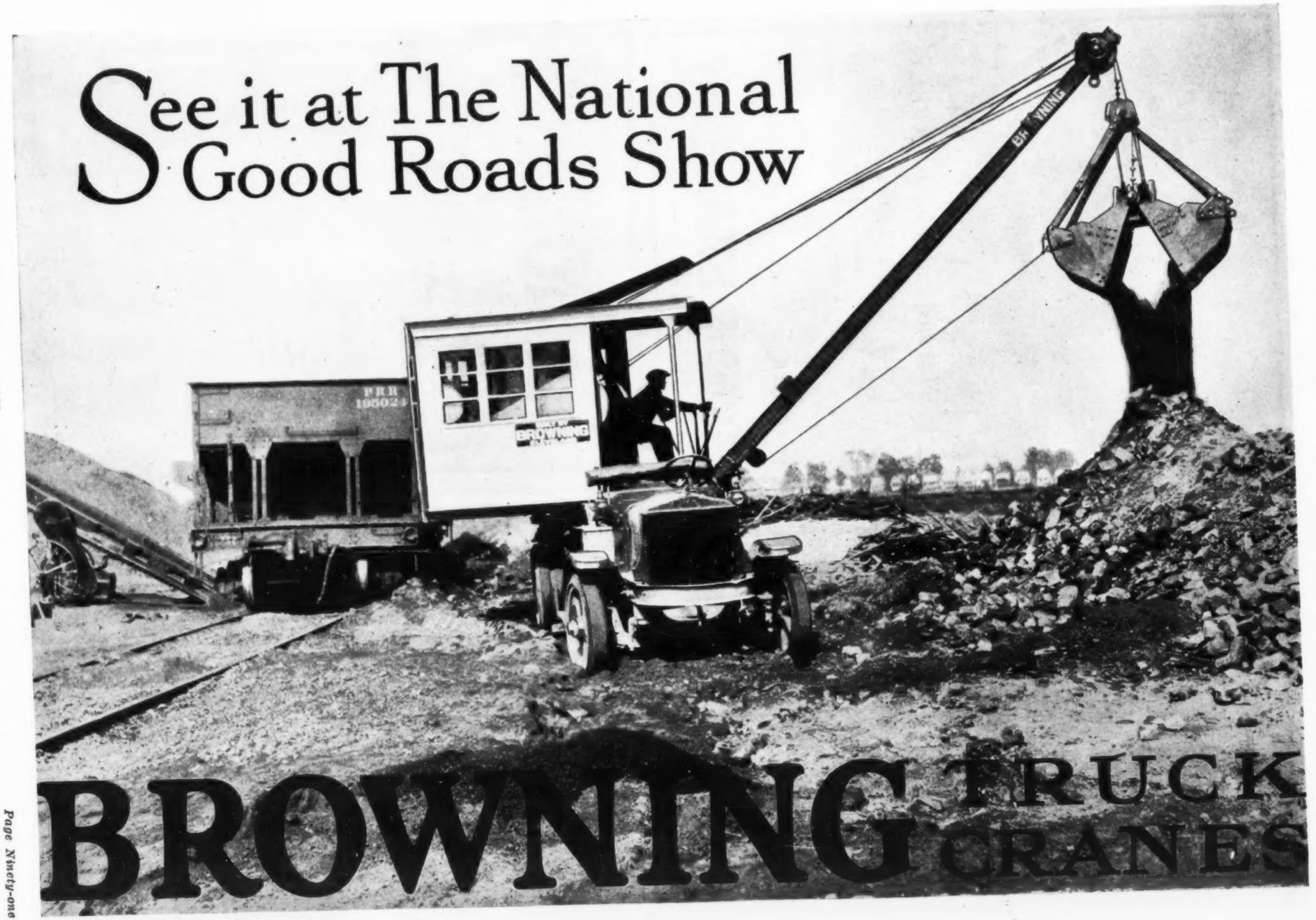
For highway builders, quarries, construction jobs, Universal Crushers handle a great range of sizes with remarkably low upkeep and operating costs.

Stationary or Portable with or without elevators and screens.

UNIVERSAL CRUSHER COMPANY

327 8th Street, West, Cedar Rapids, Iowa

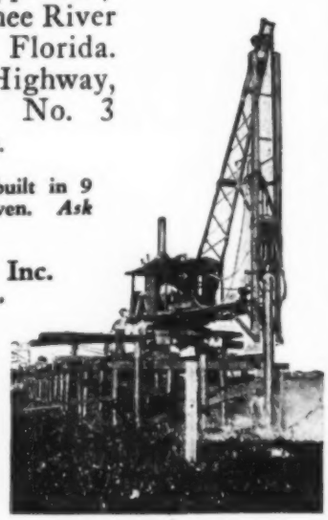



See it at The National
Good Roads Show
BROWNING
TRUCK
CRANES

Three No. 3 UNION Hammers On This Job

Illustration shows the Union driving creosoted pile on Harding Memorial Bridge (east approach) across the Kissimmee River and marsh in Florida. Conners Florida Highway, Inc., used three No. 3 Unions on this job.

Union Hammers are built in 9 sizes—steam or air driven. *Ask about them.*

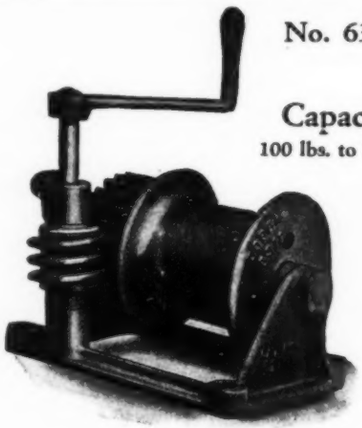


Union Iron Works, Inc.
Monroe and Grove Sts.,
Hoboken, N. J.

Builders of Double Acting Pile Hammers Since 1906

UNION·PILE·HAMMERS DRIVE AND PULL

No. 6319



Capacity
100 lbs. to 2 tons.

It holds suspended loads SAFELY

The load stays put when handled by a Dobbie Worm Winch. In a hoist of its type, it is very efficient. Send for complete data.

DOBBIE FOUNDRY AND MACHINE CO.
Niagara Falls, N. Y.

DOBBIE EQUIPMENT

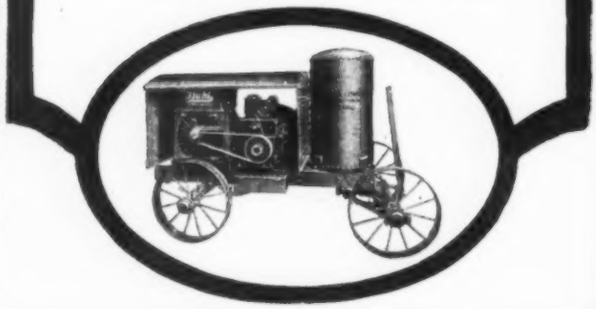
PICK UP CARTS — DERRICK FITTINGS
SULKY DERRICKS — WINCHES ALL TYPES

Buhl
AIR COMPRESSORS

Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

This is a small, compact, portable compressor. It is a single cylinder outfit with gasoline engine and compressor cylinders cast en bloc. Made in 55, 90 and 180 cu. ft. capacities. Any mounting desired. *Write for Bulletin 101.* Address

THE BUHL COMPANY
Manufacturers
37 W. Van Buren St., CHICAGO



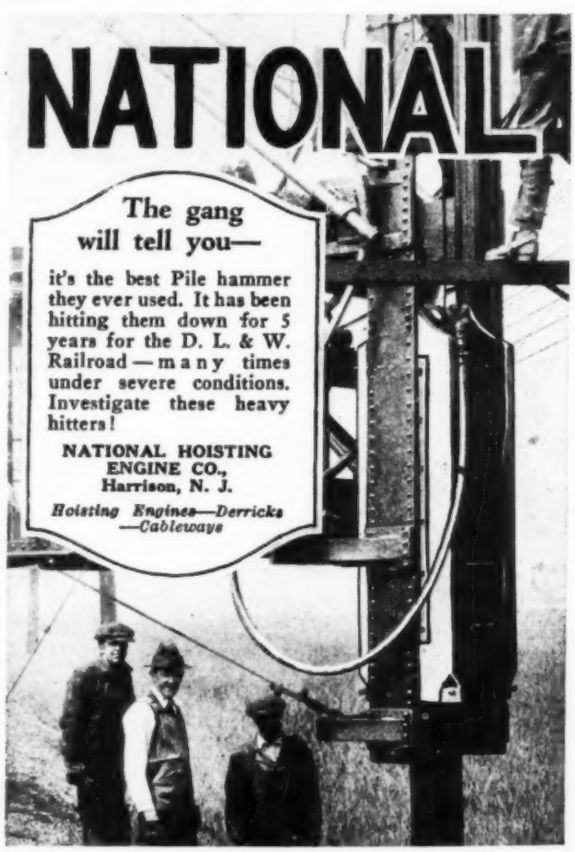
NATIONAL

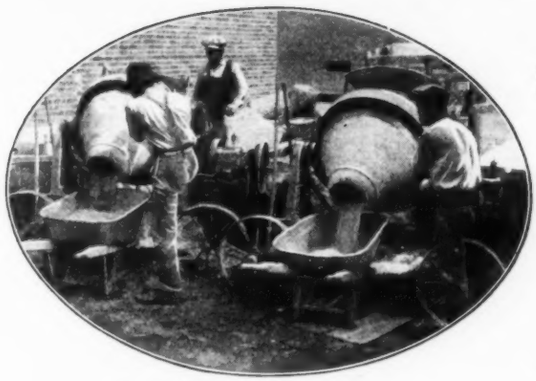
The gang will tell you—

it's the best Pile hammer they ever used. It has been hitting them down for 5 years for the D. L. & W. Railroad — many times under severe conditions. Investigate these heavy hitters!

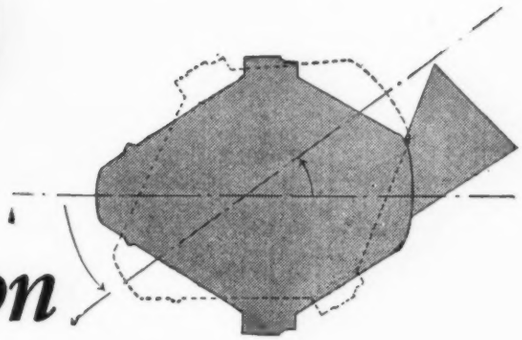
NATIONAL HOISTING ENGINE CO.,
Harrison, N. J.

Hoisting Engines—Derricks —Cableways





Speeding up a mortar mixing job with two Smith Mascots—Kilpatrick Bros., Los Angeles Contractors.



Here's One Reason a Smith Mixer is so Fast—

THE Smith double cone drum is a tilter—but it tilts only when discharging and then only through a small arc.

It is returned to horizontal in an instant—no delay—no long operation.

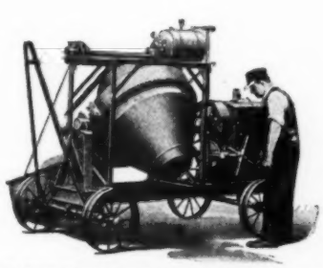
It is ready for instant charging—through chute or with skip hoist.

This fast operation means more yardage per hour—it is easy for any workmen to tilt—it is the Mixer for you.

Member of Concrete Mixer Manufacturers Bureau of the A.G.C.

Smith Tilting Mixers are built in the following sizes: 2½, 3½, 5, 7, 10, 14, 21, 28, 40, 56 and 112 cu. ft. per batch; Smith Non-Tilting Mixers: 7, 10, 14, 21 and 28 cu. ft. per batch; Smith Paving Mixers: 27-E.

The 1927 Catalog will prove of real interest to every contractor. Use the coupon below to send for your copy today.



Smith 7-S Tilting Mixer, equipped with power loader. The drum is easily and quickly tilted, as shown, when discharging.

The T. L. SMITH COMPANY
1084 32nd St., Milwaukee, Wis.
Sales Offices and Service Stations in all Principal Cities

SMITH MIXERS

THE T. L. SMITH COMPANY
Milwaukee, Wisconsin

Please send me a copy of your Mixer Catalog No. 26.
We are especially interested in a ..... mixer.
(Size of mixer)

Name .....
Address .....
City ..... State .....

1084

Mix More Concrete

with same size crew—

The biggest contractors are doing it with MARSH-CAPRONS.

The loaded skip of the 7-S goes up in six seconds—and a barrow is filled in three seconds, without slopping. Has the SPEED and CONTROL—

And can keep it up. Best built mixer that money can buy—the only mixer with guaranteed trade-in value and rebuilding cost.

All sizes from half-bag to 4-bag. Write for "LOWER COST ON CONCRETE."

MARSH-CAPRON CO., 11 So. La Salle St., Chicago, Ill.

MARSH-CAPRON

Mixer Mike says:—

If you want a speedy, efficient Concrete Mixer that's FOOL PROOF, buy "The STANDARD"

The buyer of a Mixer must consider four things—

Ease in charging—a fast, thorough mix—a sharp, clean discharge and a construction that assures long, trouble free life.

"The STANDARD" MIXER is surpassed by none in excellence—in possible output or in lasting service.

The wide diameter, narrow drum gives a thoroughly mixed batch and is a feature found only in "THE STANDARD." Before you buy any mixer, be sure you know all the facts about "The Standard."

THE STANDARD SCALE & SUPPLY CORP.

Pittsburgh — Penna.

SALES OFFICES:

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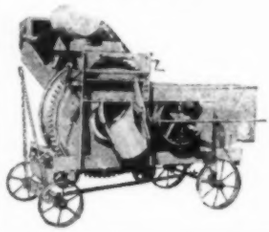
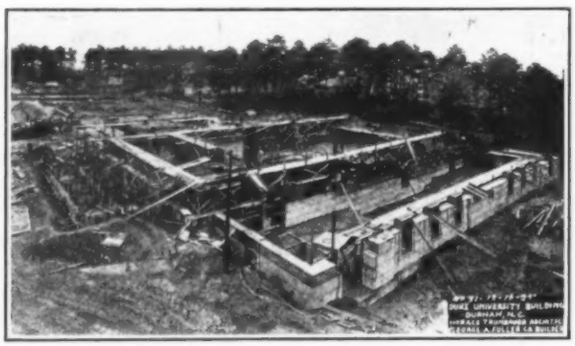
Philadelphia, 523 Arch Street
Cleveland, 721 St. Clair Ave., N. E.
Chicago, 1840 Michigan Blvd.



METAFORMS



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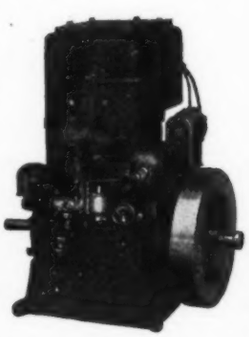

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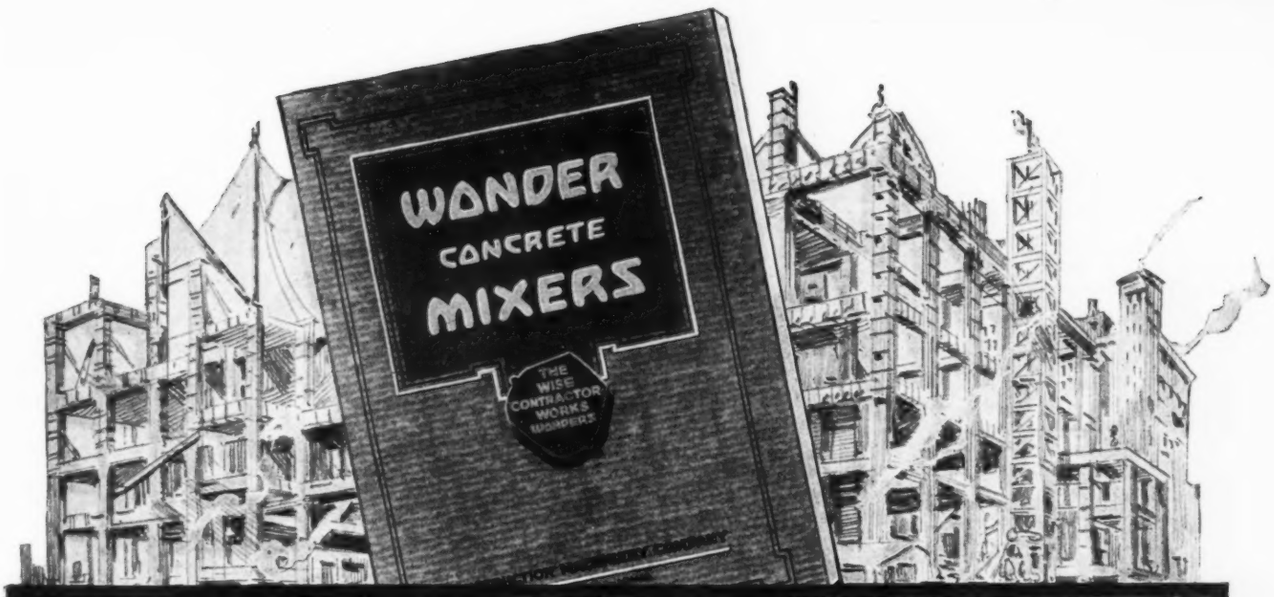

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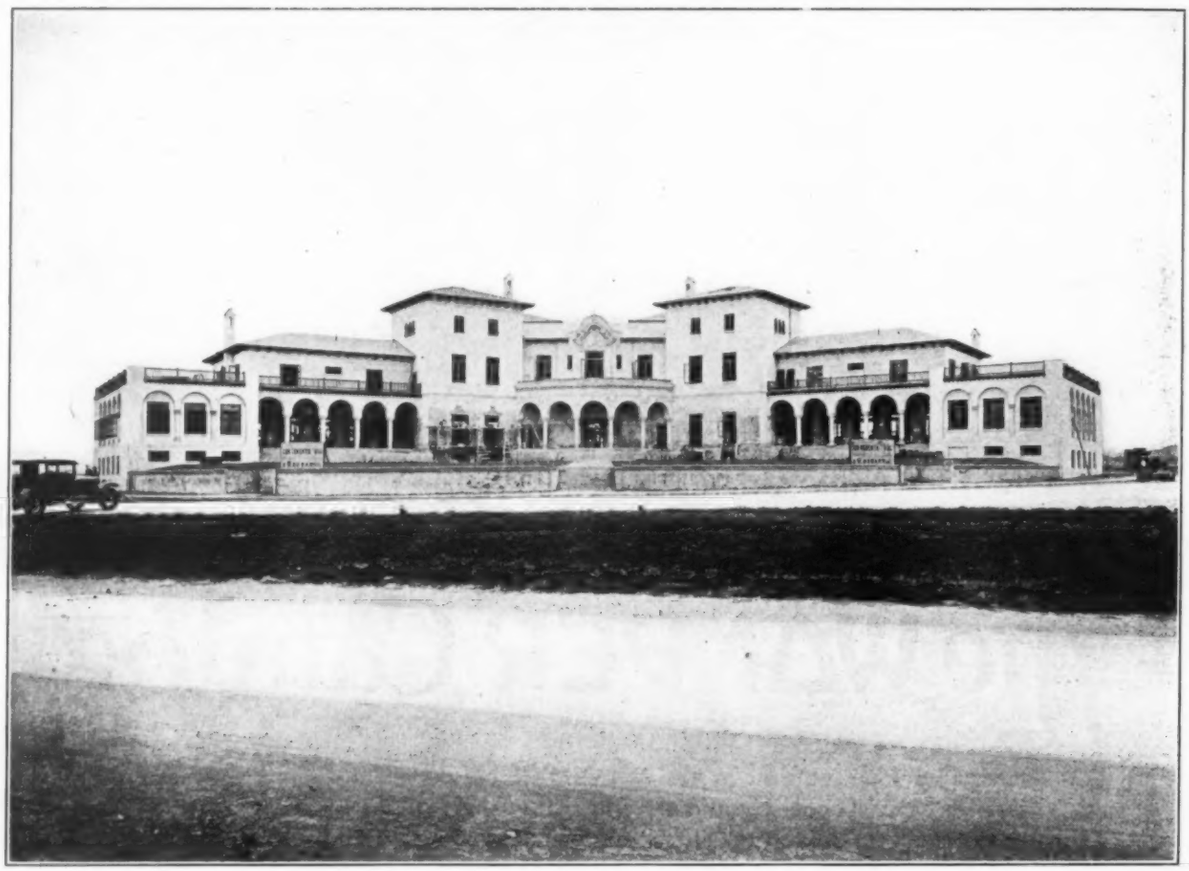

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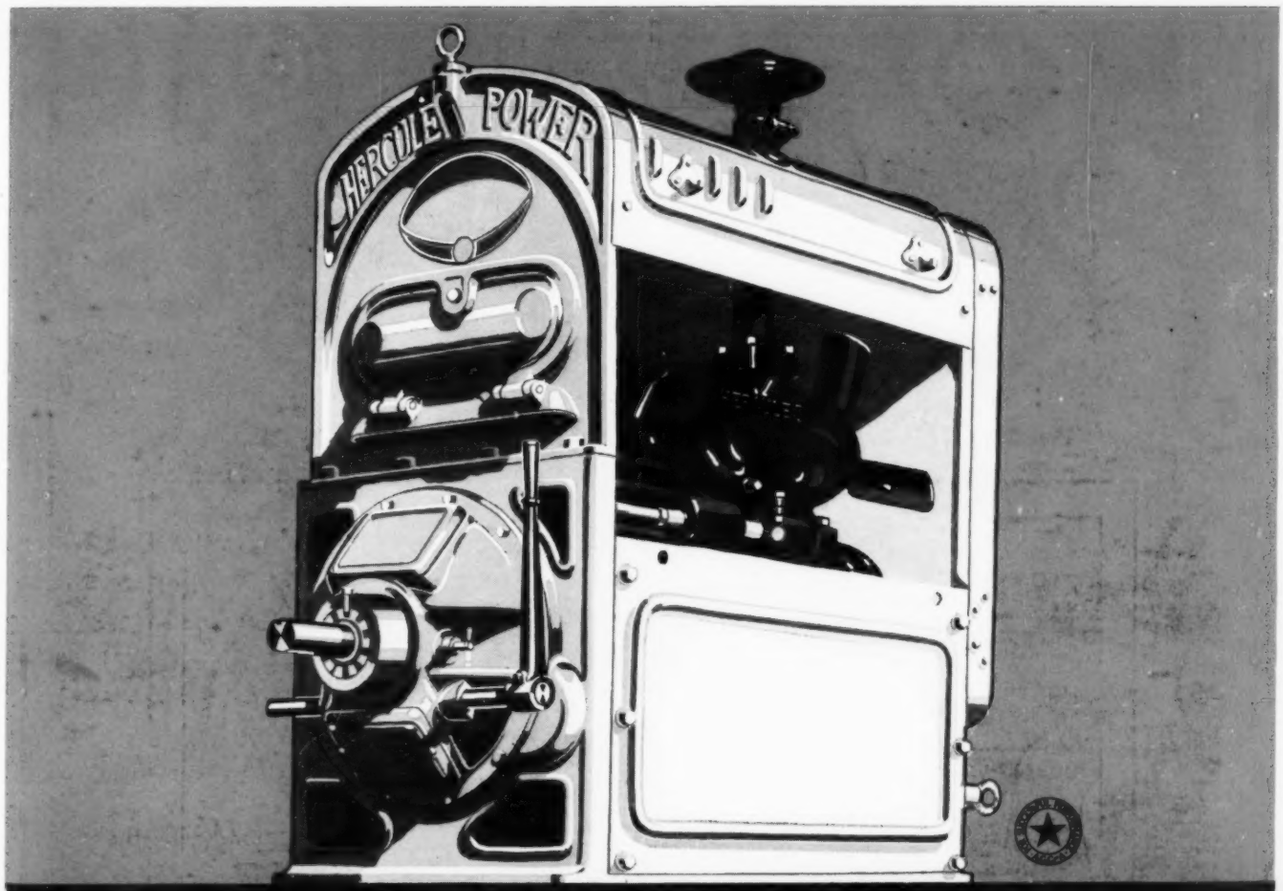

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